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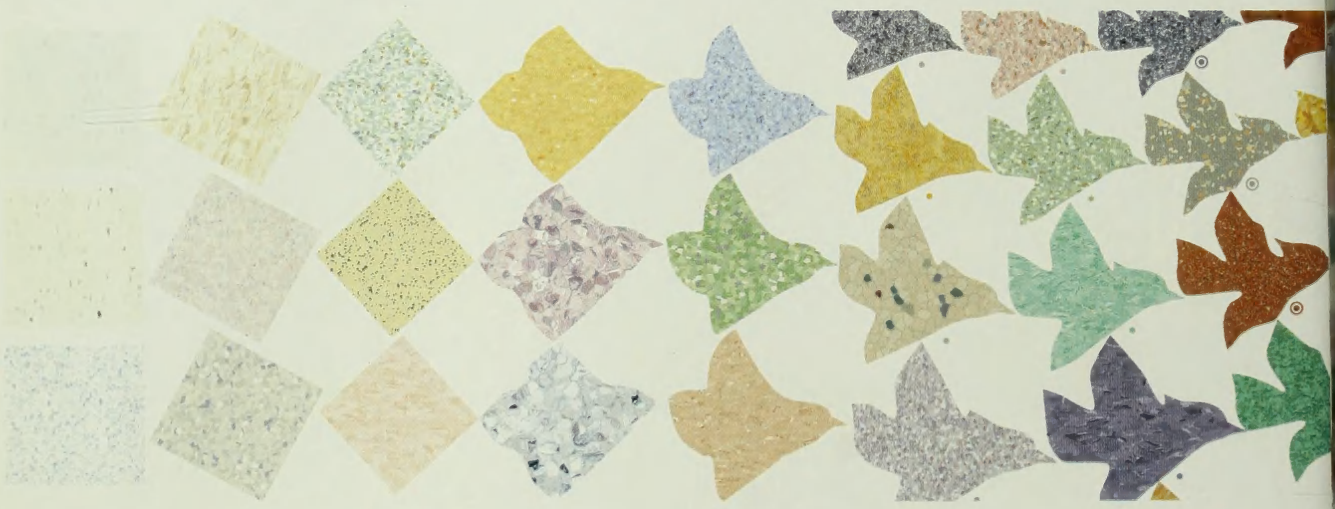
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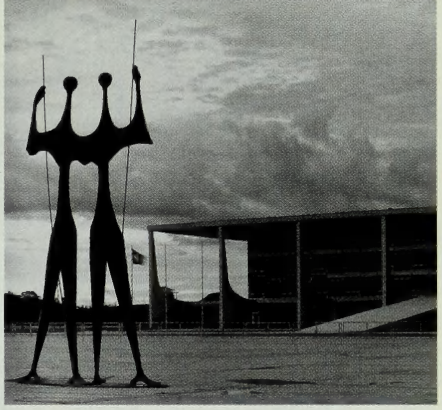
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Continuing Education: *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Safer, More Attractive Staircases" (page 181). The self-report form appears on page 216.*

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Above: *Bruno Giorgi's* The Warriors *stands before Oscar Niemeyer's Planalto Palace, Brasília. Photo © Todd Eberle.*

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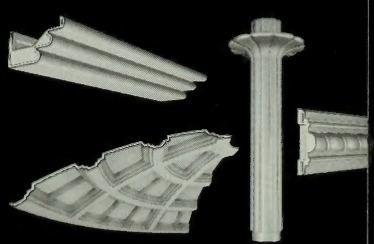
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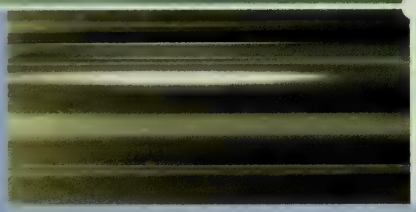
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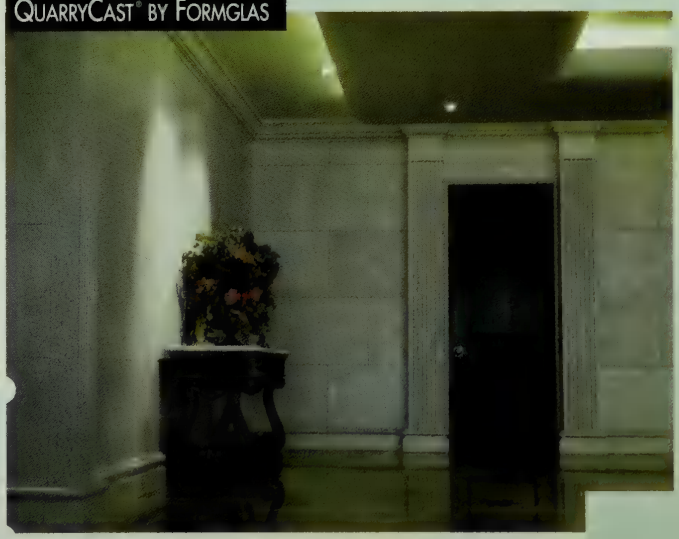
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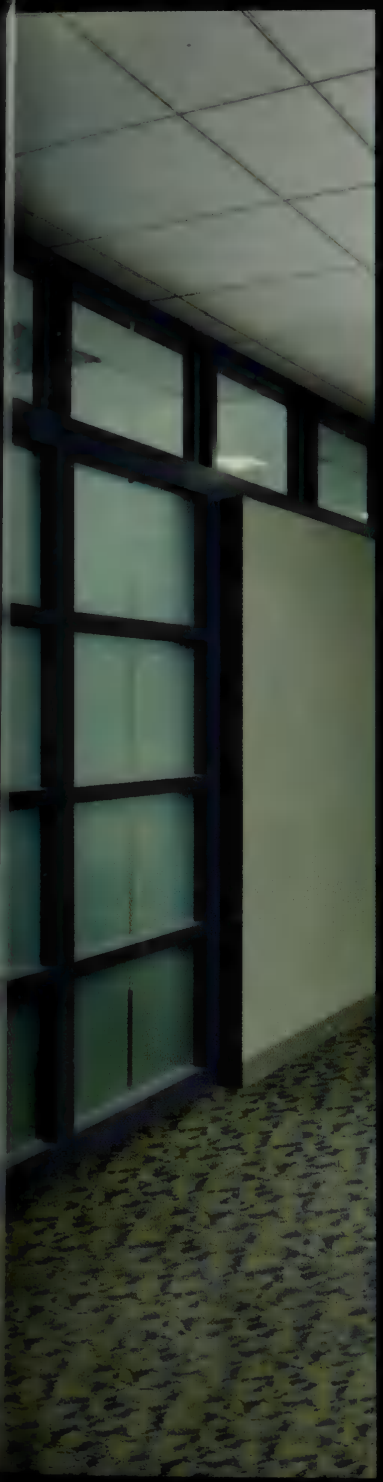
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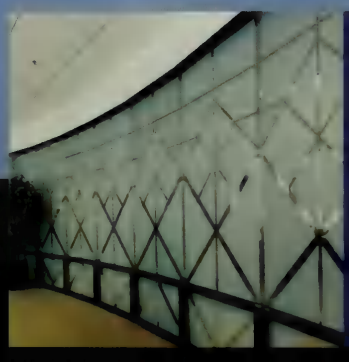
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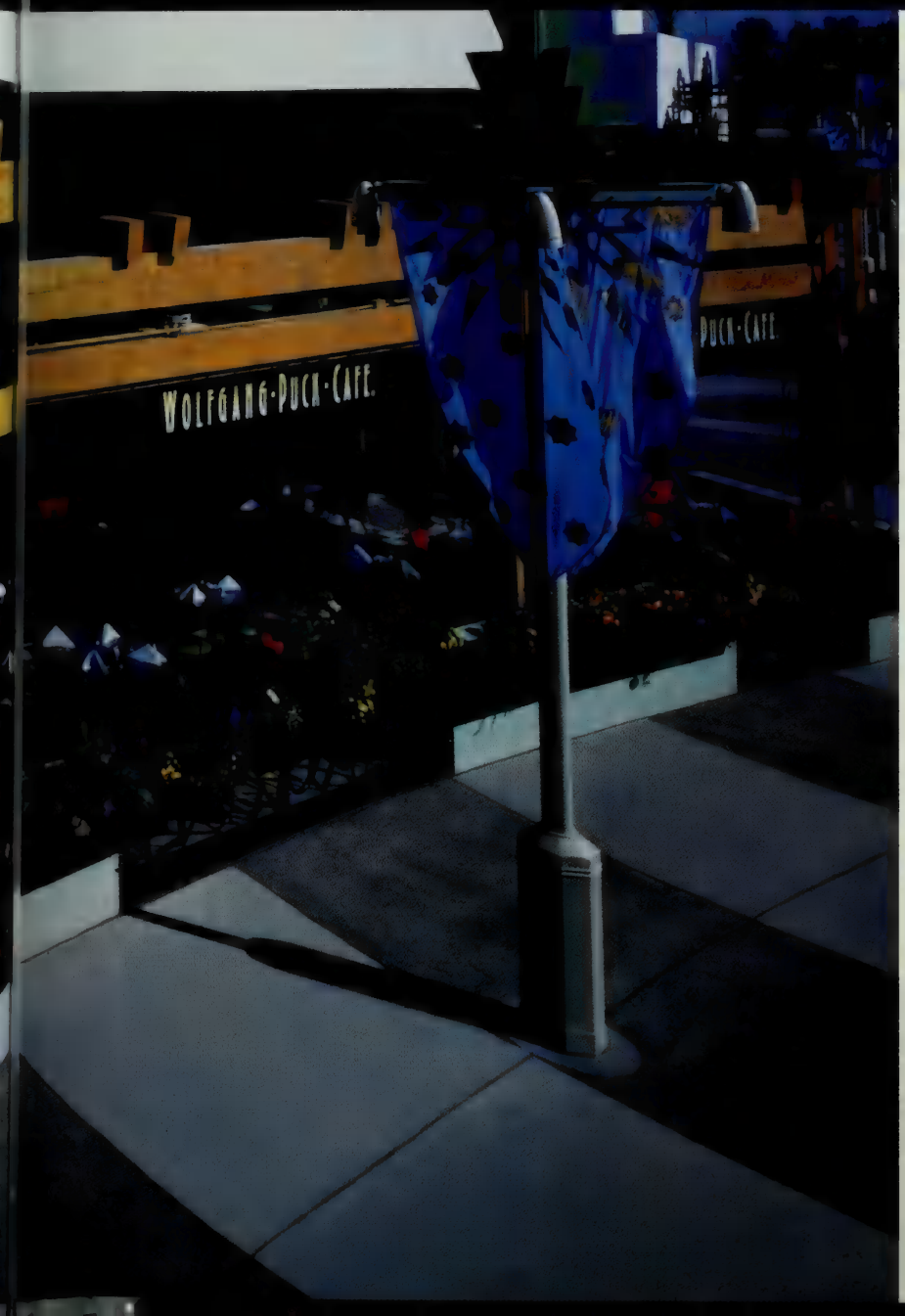
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EDITORIAL

Proving What We Feel

BY ROBERT A. IVY, FAIA

Read this quote twice: "Their settings were more important determinants of his subjects' behavior than their personalities." The import of this fragment, which refers to psychologist Roger Barker's observations of childhood development, should be obvious. Barker's work in the 1960s helped to prove that our surroundings play a critical role in molding our behavior. That environment affects experience is a fundamental theme among architects, a core understanding, yet few among us are aware that hard facts are available to back up this belief. Proponents of architecture's relationship to human experience usually resort to anecdote, intuition, and emotion, unaware that scientists are exploring the equation every day—and proving the connection.

You don't have to be a scientist to gain access to this research. Winifred Gallagher's brief, readable book, The Power of Place, *provides an introduction to environmental psychology, a field that complements our design efforts with an existing body of data. But aside from a few professors of architecture who are engaged in active research in the subject, it is rarely taught in formal coursework at architecture schools. This valuable discipline, which may seem unfashionably earnest at a cool moment in the collective psyche, has been relegated to the touchy-feely world of the 1960s and 1970s.*

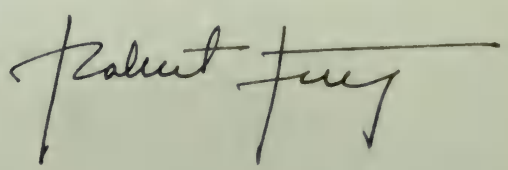
It is time to take a second look. ARCHITECTURAL RECORD*'s Interiors issue seems an apt forum to consider how spaces affect our thoughts, emotions, and actions, since interior spaces are where we spend most of our time. If contemporary society challenges us with stress, depression, and insomnia, the spaces we design can affect us in myriad positive ways: elevating our emotions, changing our moods, boosting our health, encouraging our alertness. So while genetics, upbringing, and numerous other factors are obviously important in our development, physical environment can alter, for good or ill, our interaction with family members, partners, or coworkers; our productivity and creativity; and, ultimately, our happiness.*

Findings reported by Gallagher—such as the fact that heat is a sedative and cold a stimulant—are fundamental to Architectural Technology 101. Light, she reminds us, has incredible power to alter feelings. In addition, she introduces less pragmatic, more esoteric realms, such as orientation to the compass and its effects on our sense of well-being—including the complex understanding of natural forces that the Chinese call feng shui. *She mentions the presence of "subtle energies," such as electromagnetic fields induced by high-voltage lines and radio waves, that may change the way we feel. All of these influences deserve further study.*

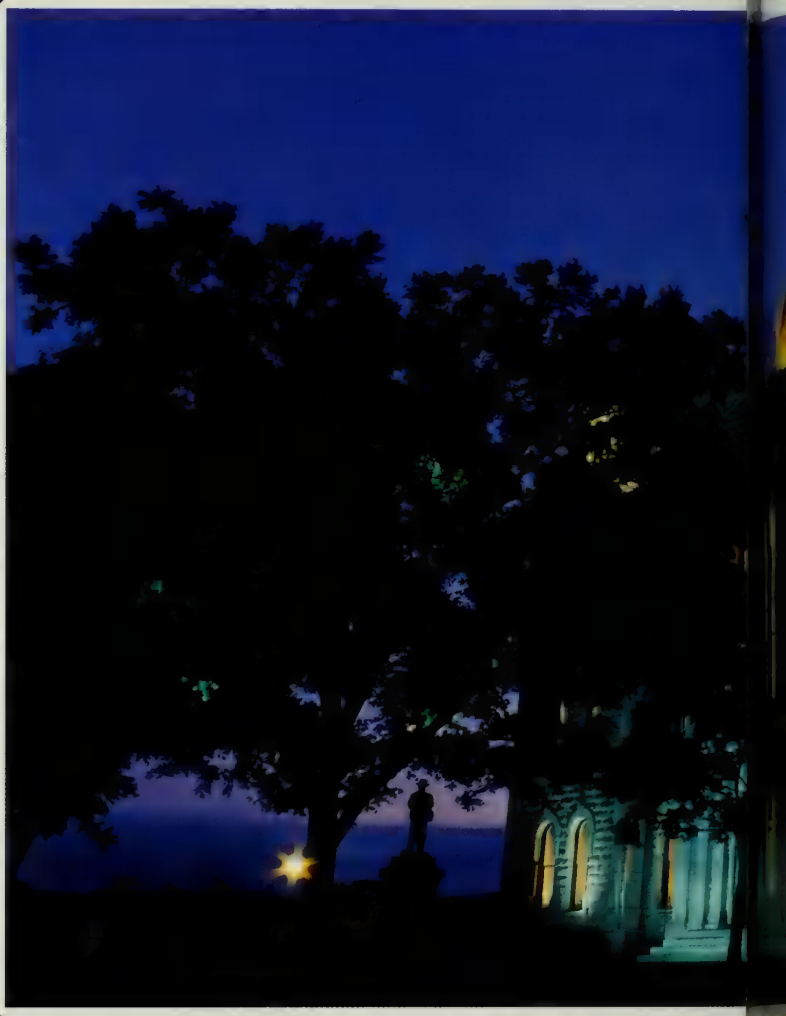
Gallagher also raises questions for architects to debate. What are restful colors? Not necessarily white, she states. What is the proper balance of sensory stimulants in any given space? What is over-stimulation and what is under-stimulation? What is the relation of human scale and the human-made object to the sense of awe and repose we find in nature?

Although environmental psychology may have been largely forgotten or ignored by architects, it offers important lessons for the profession. It may help us discover not only where people are happiest or where they feel most inhibited but, more important, how we can derive empirical data from well-conceived places of healing or learning or work.

The possible shared benefits offered by collaboration with psychologists seem obvious. Original research into the relation of constructed space to human experience, cosponsored by schools of architecture and other educational institutions or foundations, could be a vital information source and could become the cornerstone of a newfound status for architecture schools within the university. Environmental psychology may help future architects quantify what today we can express only in form and space.



WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE



In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detail. Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

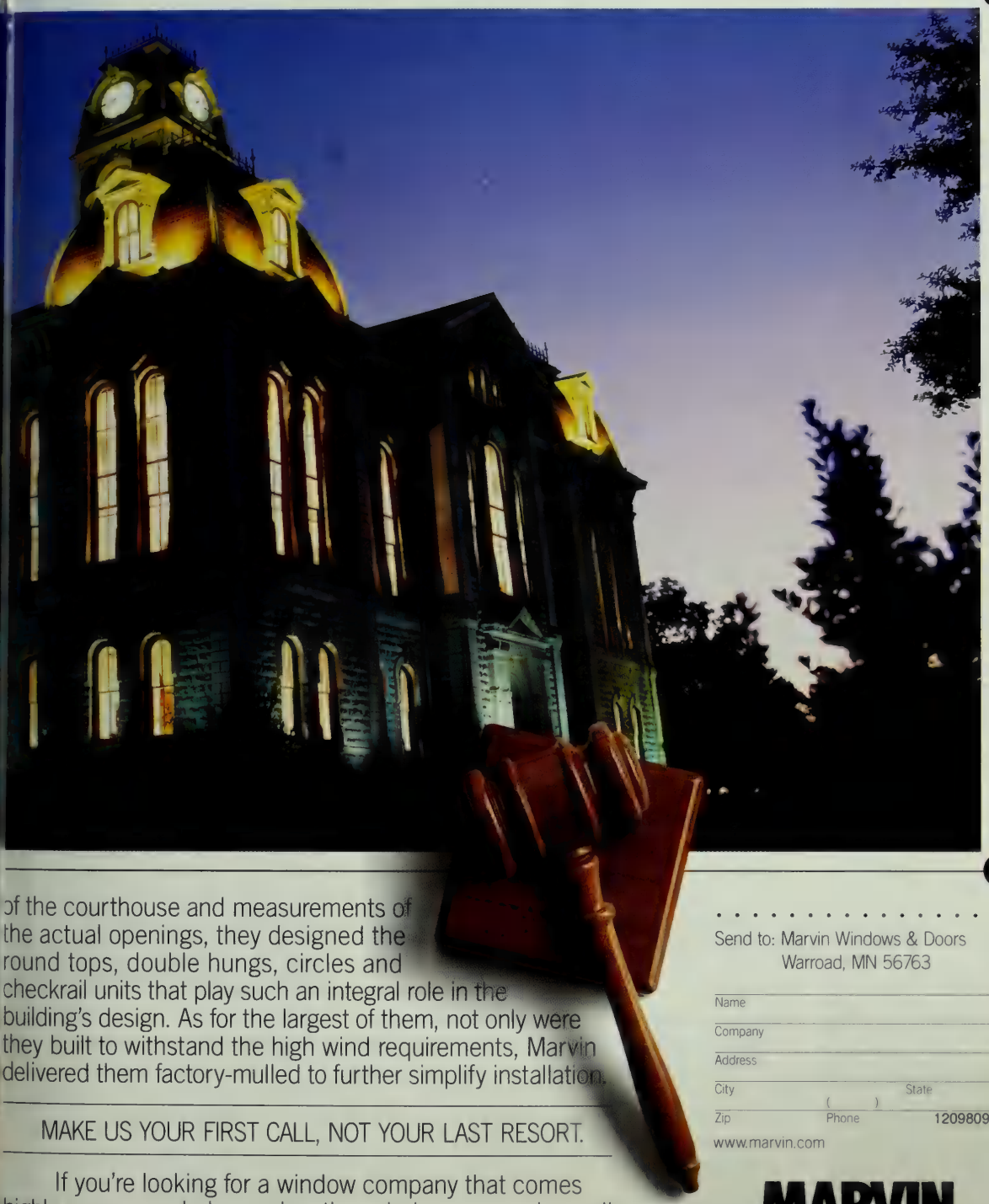


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Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

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CIRCLE 10 ON INQUIRY CARD

LETTERS

Classic protest

It is disturbing to witness an illustrious architect like James Freed squirm for having designed the Ronald Reagan Building in a classicist style [July, page 59]. The architect of the Holocaust Memorial Museum should know that good buildings need not apologize for their style any more than decent persons should bury their beliefs. That he feels compelled to do so confirms the totalitarian ethos of the current architectural scene.

—Andres M. Duany
Duany Plater-Zyberk & Company
Miami, Fla.

Salutary design?

Regarding the emergency room at North Oakland Medical Center in Pontiac, Michigan [July, page 40], I would like to humbly suggest that the last thing an emergency room patient wants to see is a space that embodies "the idea of a collision—objects forcibly coming together and breaking apart." The architects, not to mention the patients and employees of this hospital, would have been better served by employing metaphors of healing and wholeness in their design. Your headline writer got it right: "Designed by accident." What were the architects thinking?

—David Greusel, AIA
HOK Sport
Kansas City, Mo.

Architect pols

I really enjoyed reading Blair Kamin's article in the July issue about Chicago's successful public works program under Mayor Richard M. Daley [Correspondent's File, page 25]. It mentions that the mayor has appointed former design professionals to his administrative cabinet, confirming my long-held contention that architects and engineers are well suited for public office. They not only have the sound business sense and excellent management skills needed to do the job well, but they also have the discipline and integrity the public looks for in their public officials. Architects in particular possess the special talent for being able to engage cultural issues and form solutions that can bridge and heal.

It's been said that architects are the "quiet giants" of society, but there is no reason to think they need to remain quiet when their skills could affect more universal good if they were more publicly applied.

—Michael J. Hyatt
Philadelphia, Pa.

Wheelchair guidelines clarified

Nancy Solomon's article in the July issue ["Understanding Accessibility Laws," page 109] provides an excellent overall discussion of the current status of the ADA and should be lauded for its concise handling of "reasonable standard of care" versus "strict liability." However, there is some very important information about accessible assembly seating that should also have been included.

The diagram included in the story, available from the Department of Justice since it issued its 1996 Statement on Accessible Stadiums, does not clearly define "comparable line of sight." This has been problematic since the ADA Accessibility Guideline was issued. Without dimensions defining standards for the location of a spectator's eye height, shoulder height, and height of the top of the head, the illustration does not provide the architect with the information necessary to design accessible wheelchair locations.

These dimensions are now available from the ADA Web site (www.usdoj.gov/crt/ada/adahom1.htm) as a result of the Minnesota settlement and should have been included in the illustration.

—Gordon E. Wood, AIA, Principal
Ellerbe Becket
Kansas City, Mo.

Credits/corrections

The two model shots of the Ronald Reagan Building that appear on the lower right hand side of page 64 in the July issue should have been credited to Eric Schiller.

In the July story "Listening to Clients" (page 52), the firm of Ayers/Saint/Gross was misidentified.

In addition to the architects cited in the May story on the California Science Center (page 177), the following staff of the State of California, Department of General Services, Division of the State Architect, also deserve credit: Fred Hummel, FAIA, State Architect; Glenn Hezmalhalch, project manager; and Gary Sills, assistant project manager.

In the trade show roundup that appeared in the August Products pages (page 175), Spain's ceramic tile show, Cevisama, was misspelled, as was Pamesa, a Spanish tile manufacturer. ■

Letters may be faxed to ARCHITECTURAL RECORD at 212/904-4256 or E-mailed by visiting our Web site at www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length, taking care not to change the meaning.

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CIRCLE 11 ON INQUIRY CARD

SPEAK OUT A Dallas architect considers a major competition for a local arena to have been grossly unfair and misleading.

ROBERT L. MECKFESSEL, AIA

Robert L. Meckfessel, AIA, is president of F/M Associates, an architecture, graphic design, and interior design firm with offices in Dallas and Singapore. He earned a master's degree in architecture from the University of Texas at Arlington in 1979.



A recent design competition held in Dallas was so flawed that it serves as a prime example of how not to select an architect for a major civic structure—in this case, the new Dallas Arena, home to the local basketball and hockey teams, the Mavericks and the Stars.

Although owned by the city of Dallas, the arena will be operated by Hillwood Development, whose owners have significant equity in the teams and have threatened to relocate both to the suburbs. To counter this possibility, the city, after much negotiation, agreed to issue $125 million in bonds to fund a portion of the costs of a new downtown arena. However, many citizens and elected officials were greatly concerned about the wisdom of the plan, and city officials decided to put the issue to a public vote.

During the campaign preceding the referendum on whether to issue the bonds, numerous claims were made by both sides, including statements by Hillwood that the firm intended to build a "world-class and innovative" facility for the next millennium. After much heated debate, the referendum passed by a margin of 51 to 49 percent, and the arena moved ahead.

Hillwood then announced that a design competition would be held to select an architect, and invitations were issued to five firms: Pei Cobb Freed & Partners, Ricardo Legorreta, Murphy/Jahn, Kohn Pedersen Fox, and David M. Schwarz. After a two-stage process with little public involvement, Schwarz was announced as the winner, in spite of the fact that the firm had apparently not produced any concrete design proposals, only a series of facade designs in various styles for the developers to peruse and choose from. The limited amount of work that was made available for public viewing was at best banal—appropriate for a theme park, maybe, but not for a progressive city with a desire to be "innovative."

Much of Dallas's architectural community was stunned and embarrassed by this turn of events, and several parties—including members of AIA's Dallas chapter—wrote letters to the editor and testimonies to the City Council. In retrospect, though, we local architects should have seen it coming, since control of the selection process was placed entirely in the developers' hands, in spite of the infusion of public money.

It was only natural that the developers would run their competition by their rules and in their own interest. That this occurred is not surprising; in Dallas, as in many cities, selecting architects for development projects through limited competitions is considered a normal process.

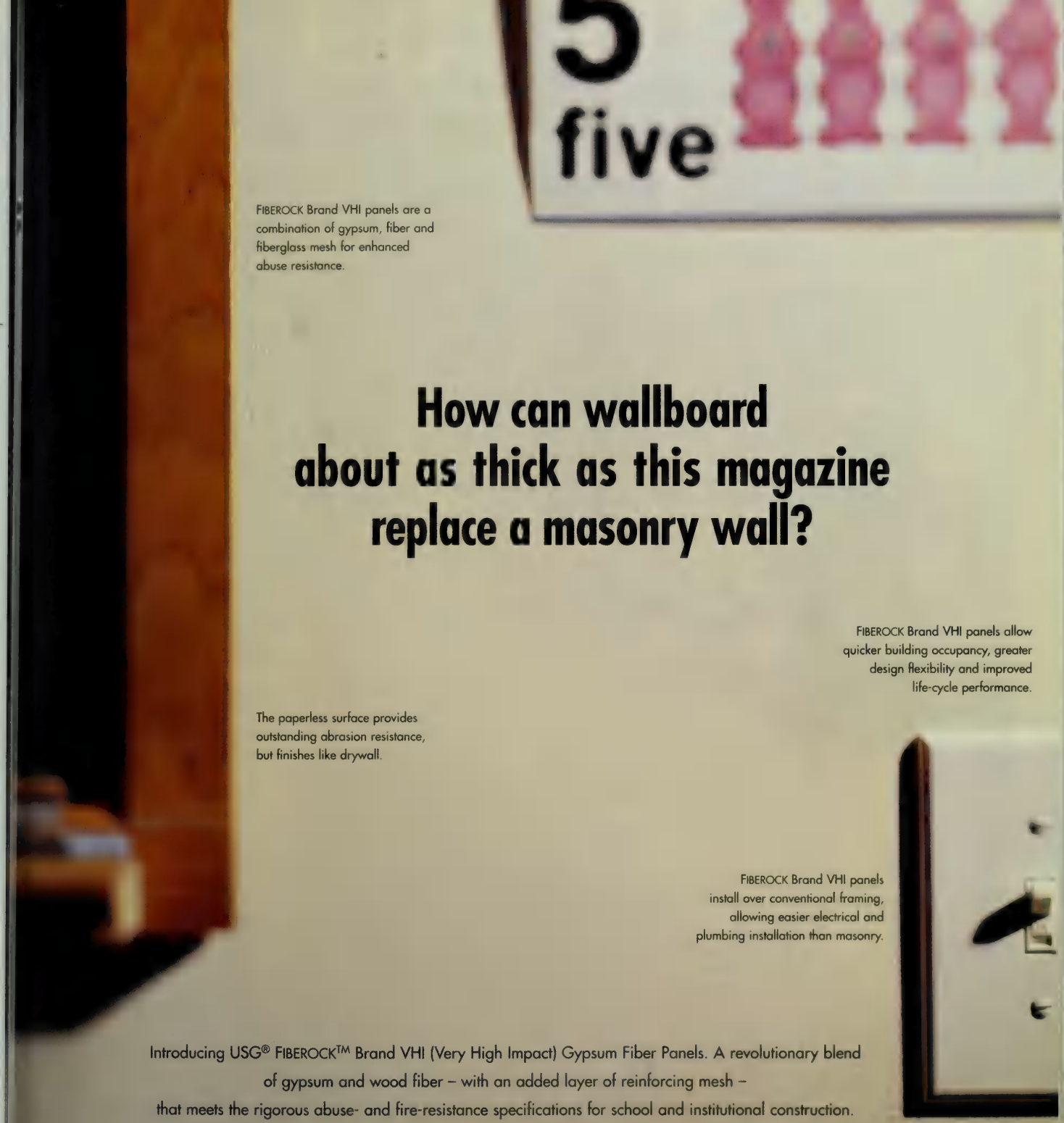
What was overlooked by almost everyone, though, was that this was not a typical developer competition: a great deal of public money was involved. In exchange for its participation, the city should have required a higher-quality competition run in a professional, responsible manner according to an accepted set of rules, such as those of the AIA.

Such a competition could have been run with the consultation of a professional advisor, civic leaders, and the architecture profession. All would have participated in the development of the competition goals and criteria and in the selection of a qualified, balanced jury that included not only the developers but also design professionals, civic leaders, and representatives of the public interest.

Instead, the Dallas Arena competition was run for the sole benefit of the developers and their priorities, with no provision made for input from other affected parties, including the citizens who are now obligated to repay the millions of dollars in bonds that support this project.

It may be too late to salvage the Dallas Arena. However, as we are seeing more and more public and private cooperation involved in major development projects, this competition should serve as a cautionary tale for institutions and cities—and those who care about them—of how a selection process can go awry. Competitions must be carefully and equitably structured from the outset. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/ Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*



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CIRCLE 12 ON INQUIRY CARD

MENTORS Mediation can provide a quick resolution to a construction-related dispute if the parties are properly prepared.

Zela Claiborne is a partner in the law firm of Bronson, Bronson & McKinnon LLP in San Francisco, a fellow in the American College of Construction Lawyers, and a mediator with the American Arbitration Association.



When the AIA introduced new versions of two standard construction contracts (A201 and B141) last fall, it added a mediation requirement: before arbitration or litigation, disputes must be mediated under the rules of the American Arbitration Association (AAA). Because more construction-related disputes will now be mediated, RECORD asked Zela Claiborne, a lawyer and mediator, to discuss what architects should expect from the proceedings and how to prepare for them.

Mediation has grown in popularity, and for good reason: surveys claim a success rate for mediation of around 90 percent. It is a low-risk procedure that allows for a speedy resolution and involves a relatively low cost when compared to arbitration or trial.

The first step in ensuring the success of the process is the selection of an appropriate mediator. Participants should choose a mediator with experience in construction disputes and a reputation for fairness.

Equally important is the selection of participants; mediation will work only if each party is represented by a decision maker with full settlement authority. The process depends on hearing an opposing viewpoint and evaluating it with an open mind. A person who is heavily involved in the events leading to the dispute may be too biased or too eager to justify earlier behavior to make an effective representative.

Another crucial element is preparation: mediation will be successful only if the parties prepare adequately. Architects should plan a mediation strategy with care. Claimants in a large dispute will have to pay consultants to draft at least a preliminary claim document if they expect to receive a substantial settlement. In complex disputes, some discovery—an exchange of documents or taking depositions—may have to take place if mediation is to lead to resolution. Money spent getting ready for mediation is easily justified if it leads to a prompt settlement. With proper preparation, the parties have an excellent chance of reaching a timely and economical resolution.

The mediation procedure itself is simple and straightforward. Usually, short briefs outlining the factual background of the dispute, the key issues, and the applicable law are exchanged. After opening statements by counsel, there may be presentations by experts or by one or two key witnesses, usually followed by group discussion covering the most important issues. The mediator then meets with each party individually to discuss the strengths and weaknesses of its position and to explore settlement options.

Parties should be willing to exchange information freely in mediation because the procedure is confidential. AAA rule M-12 provides that information disclosed to a mediator in confidence shall not be divulged by the mediator. Furthermore, the law in most states provides that views expressed and information shared, including admissions, are to be kept confidential and cannot be introduced as evidence in any future proceedings.

Mediation is not binding, but it can be used to reach a voluntary settlement. The point of the process is to encourage the participation of the parties and allow them to craft their own resolution, rather than having one imposed by an arbitrator, judge, or jury.

Settlements reached in mediation are enforceable, however, if the key terms are agreed upon in a written statement. The agreement may be handwritten, and it should be executed before the proceedings close. A more formal agreement should then be prepared by counsel within a period of time agreed upon at the mediation. Adhering to this formula will assure that a successful mediation truly results in a prompt settlement and avoids the costs of protracted litigation.

A successful mediation means the parties involved retained control of the settlement of their dispute. The format allows for creative solutions, perhaps involving more than a simple payment. In addition, parties that have worked together in the past may be able to salvage their business relationship. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

ERFECTIONIST

"Arizona's new domed stadium might have had games rained out — inside."



Michael Hart, M-E Engineers, Inc., Denver

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JM

Johns Manville

CIRCLE 13 ON INQUIRY CARD

OHNS MANVILLE

PULSE RECORD readers were asked: Are many municipal zoning policies outdated or inappropriate?

Yes: Municipalities across the nation are discovering the harmful effects of zoning. Creators of traditional neighborhood development regulations understand that it doesn't make sense to keep buildings from touching other buildings or to isolate activities from each other. Zoning isn't an outdated idea; it wasn't a good idea in the first place.
—Nathan Isley, AIA
Isley Architects, Inc.
Durham, N.C.

Yes: Municipalities can and should constantly review their own zoning ordinance shortcomings. Many smaller municipalities' zoning ordinances do not reflect more modern, popular uses such as fitness centers or specialty restaurants, nor do they have updated strategies for dealing with cars and parking requirements. More often than not, these modern uses, because they are not permitted uses, result in a prolonged review process that can unnecessarily exhaust an applicant's economic resources. The result is a less-than-successful end product.
—James Fleming, Architect
Larchmont, N.Y.

Yes: While zoning is not obsolete, the pace at which ordinances reflect current city development is often prohibitive and reactive. For example, Milwaukee is replacing its zoning code to update outmoded policies and be proactive in scope. A simplified, illustrated code will clarify and encourage desired yet flexible development outcomes. Thoughtful, productive development will be encouraged while existing neighborhood character and patterns will be protected. Development will be permitted, rather than policed, by the revised code.
—Karen Mierow, Senior Architect and Planner
City of Milwaukee Department of City Development
Milwaukee, Wisc.

Yes: No zoning ordinance can serve all situations well and forever. If zoning policies have not been reviewed in 20 years or so, they are indeed outdated or obsolete.
—Leah R. Karpen
Asheville, N.C.

Yes: In hundreds of U.S. cities, old buildings, with the streetscape, density, and character that they offer, are being bulldozed for big-box chain stores and fast-food outlets. Zoning can be used to require street walls, to grant bonuses for upper-floor apartments, or to require parking in the rear of the building. Few cities have done this, and mayors and the public simply wring their hands.
—Richard L. Rosen
Mark IV Construction Co., Inc.
Rochester, N.Y.

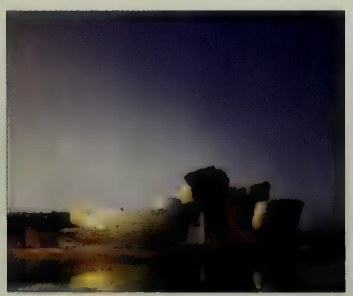
Yes: Zoning policies must encourage a greater variety of uses, and they must be based on performance rather than prescriptive standards. An architect's creative problem-solving abilities can be more effective in making communities more livable when prescriptive standards such as land use, setbacks, and building height are replaced with a more precise statement of the problems those standards were intended to solve.
—Vernon Reed, FAIA
Reed Architects
Liberty, Mo.

This Month's Question

What do you think?

Guggenheim Museum, Bilbao, Spain

Few buildings completed in the last decade have evoked as much interest as the Guggenheim Museum in Bilbao, Spain (RECORD, October 1997, page 74). ARCHITECTURAL RECORD invites your personal observations on this project by Frank Gehry.



May an editor contact you for comments?
☐ Yes ☐ No

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Episcopal Church of the Transfiguration
Dallas, Texas



The thirty five foot diameter terrazzo labyrinth is created by one foot wide walking paths separated by one inch wide terrazzo filled bands. The scalloped perimeter of two color terrazzo highlights the continuous weaving walking path.

ARCHITECT
Good Fulton, & Farrell Architects
Dallas, Texas

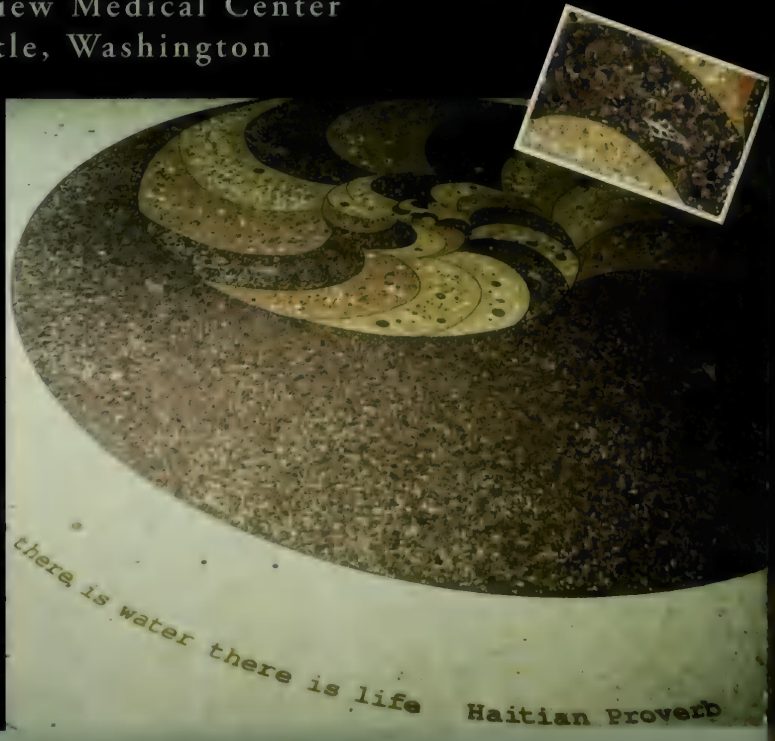
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Harborview Medical Center
Seattle, Washington

From the conceptual beginning the owners were extremely receptive to the idea of terrazzo in this 8000 sq.ft. of high traffic entry lobby. Terrazzo's reputation for durability and ease of maintenance were the main appeal, however, its beauty and ability to adapt easily to design made it the defining architectural element in the lobby.

ARCHITECT
Kaplan McLaughlin Diamond
Seattle, Washington

DESIGNER/ARTIST
Linda Beaumont
Seattle, Washington



"National Terrazzo & Mosaic Association 1997 Honor Award"

Office Building
Broomfield, Colorado



The interior and exterior terrazzo flooring with zinc strips expresses the geometric principals of the building design, with the spiral patterns expressing an understanding of the nature and the desire to embrace our planet and live in harmony.

ARCHITECT
Downing Thorpe James
Boulder, Colorado

DESIGNER/ARTIST
Gregg Lefevre

"National Terrazzo & Mosaic Association 1997 Honor Award"

Knoxville Center
Knoxville, Tennessee

Cement Terrazzo with chips representing the warm shades of summer, were used for Cades Cove, where early [illegible] in the Smoky Mountains. Rich blues & greens in epoxy terrazzo were poured to represent the many trout streams of the Smokies. Epoxy terrazzo was used to depict the layout of the University of Tennessee, complete with stadiums, roads and buildings. Each building is labeled with inlayed marble letters.

ARCHITECT
Omni Plan
Dallas, Texas

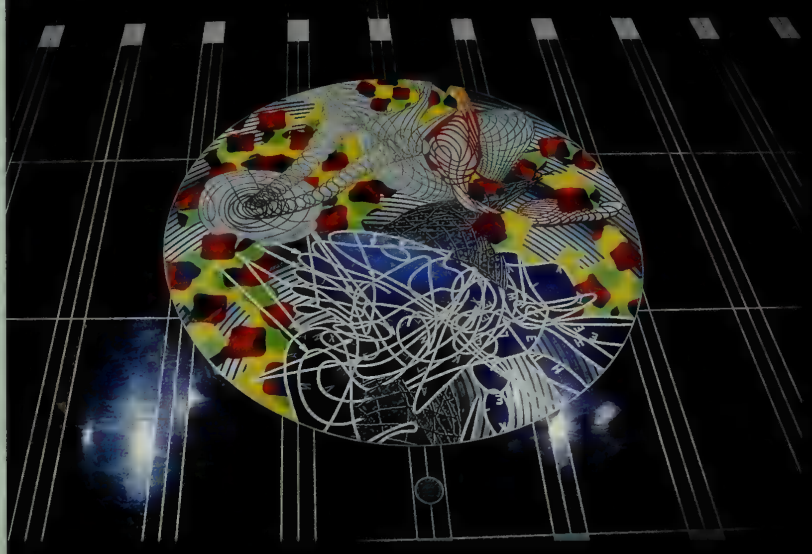
DESIGNER/ARTIST
Commercial Arts Inc.
Boulder, Colorado



"National Terrazzo & Mosaic Association 1997 Honor Award"

Ronald Reagan Washington National Airport
Washington, D.C.

Job Of The Year



The New Terminal at Washington Airport represents a facility designed to make the experience of being in an airport as pleasant and stress free as possible. The floor pattern facilitates the feeling of moving freely in the terminal while providing opportunities to enjoy some of the nation's finest artistic expressions. This was accomplished by the use of a four color terrazzo pattern with 1/2-inch wide dividers and an "architectural enhancement program" that incorporated eight, eighteen foot diameter, artist inspired mosaics. The durability, low maintenance, and performance of the terrazzo in the existing 50-yearold terminal, in addition to the creative color versatility of Epoxy terrazzo, made it the logical choice for this outstanding synthesis of art and architecture.

ARCHITECT
Cesar Pelli & Associates
New Haven, Connecticut
Jan A. Daly Company
Washington, D.C.

MOSAIC DESIGN ARTISTS
"Hooloomooloo"
by Frank Stella (top)
"Lips" by Joyce Kozloff (bottom)



"National Terrazzo & Mosaic Association 1997 Honor Award"

Residence
Chicago, Illinois



The architect wanted a soft, warm feeling for this shower room as opposed to the hard and jointed appearance of tile. Rustic terrazzo with all #1 aggregate was installed on the floor, walls, and ceilings with no right angles. All corners in and out, were rounded to create a soft look.

ARCHITECT
Design III
Chicago, Illinois

"National Terrazzo & Mosaic Association 1997 Honor Award"

U.S.A. Group
Indianapolis, Indiana

The owner needed to brighten up the lobby of this 93 year old building but needed a floor that could take the punishment of thousands of people walking on it daily. This five color terrazzo floor will easily last another 90 years.

DESIGNER
Rowland Design, Inc.
Indianapolis, Indiana



"National Terrazzo & Mosaic Association 1997 Honor Award"

New York, New York Hotel & Casino
Las Vegas, Nevada



This terrazzo project consists of 32 different and vibrant colors of terrazzo. The colorful light rays of terrazzo draw you toward the casino gaming machines and tables. In the center of the casino is an area similar to New York's Central Park. This area includes a black and white terrazzo mosaic, duplicating the Lennon "Imagine" Memorial.

ARCHITECT
Gaskin and Bezanski
Las Vegas, Nevada

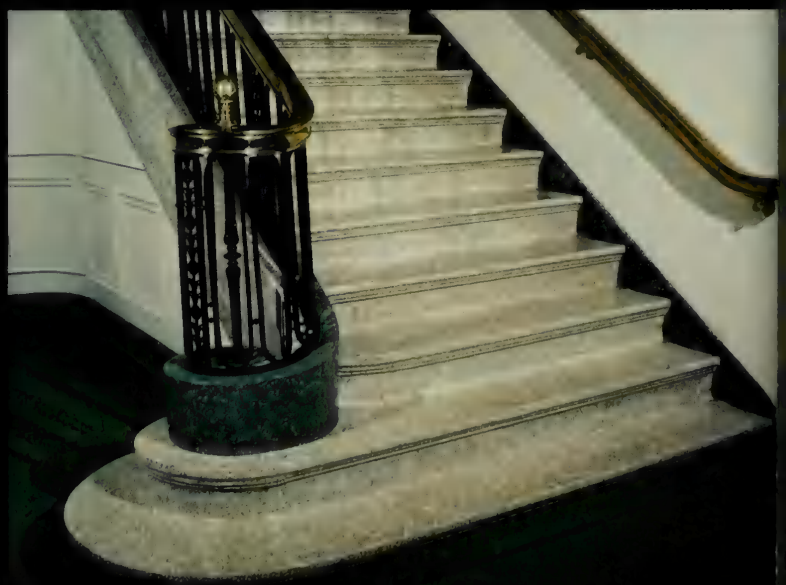
DESIGNER/ARTIST
Yates Silverman Inc.
Las Vegas, Nevada

"National Terrazzo & Mosaic Association 1997 Honor Award"

Federal Center
Battle Creek, Michigan

The terrazzo contractor had to match steps that were originally done in 1933. These are poured in place, terrazzo steps with 2 colors on the bottom of the stair and a different color on the stringer. Also note the intricate curb & fascia and how it wraps around the open side of the fascia. The underbed, concrete, and terrazzo topping were all done free-hand.

ARCHITECT
Ghafari Associates, Inc.
Dearborn, Michigan



"National Terrazzo & Mosaic Association 1997 Honor Award"

Akard/Pacific Walkway
Dallas, Texas



Terrazzo was used on floors and wall surfaces in this project mainly because of its durability and maintenance qualities. At both ends of this link are 30 year old terrazzo that still looks pristine. This walkway allows pedestrians to travel between buildings without going into the outside elements.

ARCHITECT
Philip Henderson
Dallas, Texas

"National Terrazzo & Mosaic Association 1997 Honor Award"

Buffalo Niagara International Airport
Cheektowaga, New York

A topographical map of the Niagara Frontier - which is comprised of Western New York state including Buffalo and surrounding regions as well as the southern portion of the Canadian Providence of Ontario, including Toronto. Each trail emanating from the "Tapestry" describes an historical event or a distinguishing feature of the Niagara Frontier Region.

ARCHITECT
Fentress Bradburn Pedersen Fox Associates
New York, New York

DESIGNER/ARTIST
Kathy Lukes
Portland, Oregon



"National Terrazzo & Mosaic Association 1997 Honor Award"

Santa Monica Civic Auditorium
Santa Monica, California



This project has 20 different colors of terrazzo. Some of the cement terrazzo colors on the ground level have Venetian chips. While some of the epoxy terrazzo colors on the upper level have Mother of Pearl, Glass, and Plastic aggregates. The colors and design of this terrazzo truly make an artistic statement.

ARCHITECT
Morimoto & Widom, Wein, & Colon
Santa Monica, California

DESIGNER/ARTIST
Renee Petropoulos
Venice, California

"National Terrazzo & Mosaic Association 1997 Honor Award"

Oriental Restaurant Foxwood Casino
Mashantucket, Connecticut

SPECIAL AWARD

The eclectic design of the fire breathing dragon welcomes diners as they escape the gaming tables. Layers of clear epoxy, metal foil, and sprinkled applications of gold confetti glass chips, six colors of glass beads and two colors of glitter were installed by the terrazzo mechanic and artist working side-by-side to produce the appropriate colors and transitions.

DESIGNER/ARTIST
Noble Hampton
Northfield, New Jersey
Novanni Group
Glassboro, New Jersey









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ǴR Architects Engineers - Lubbock, TX
ıvid Houck - Beverly Hills, CA
ɔNell, Beeble, Barton - Spokane, WA
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CIRCLE 14 ON INQUIRY CARD

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CIRCLE 15 ON INQUIRY CARD

CORRESPONDENT'S FILE Hanoi makes big plans for its future, hoping to preserve its historic core and avoid the mistakes of other Asian cities.

BY CLIFFORD PEARSON

Crossing the street in Hanoi is no simple task. Swarms of bicycles, mopeds, motorcycles, and cyclos (the ubiquitous Vietnamese pedicabs) whizz by, uninterrupted by traffic lights and untamed by traffic lanes. The only way to get to the other side is to slowly wade into the colorful stream of twin-wheeled vehicles and let them maneuver around you. The first time you try this is unnerving.

Vietnam is in the process of figuratively crossing the street, moving from a tightly controlled socialist economy to a more open, capitalist system. On the way, it is jumping from an era of pedal-powered machines to one of electronics and international finance. It's a frightening leap, especially now that many Asian economies have experienced their first crash along the emerging-market superhighway.

Catching the eye of investors

Twenty-three years after the fall of Saigon, a unified Vietnam is finally emerging on the international scene. With a population of 80 million, a high literacy rate (nearly 90 percent, according to the Chamber of Commerce and Industry of Vietnam), and newly reformed laws encouraging capitalist enterprises, the country is attracting the attention of foreign investors, developers, and architects.

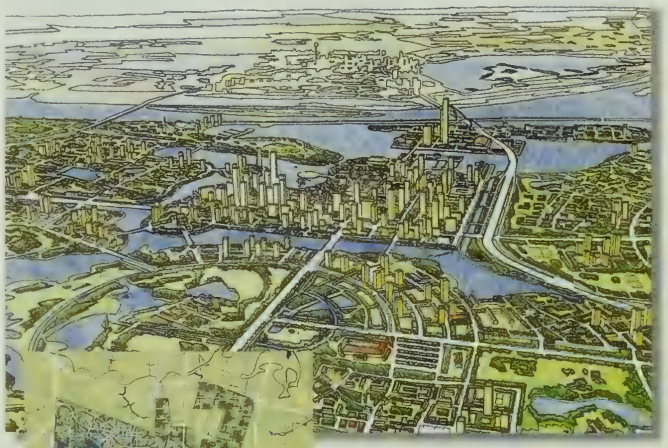
But decades of war, communism, and an American trade embargo have left Vietnam a poor nation with huge obstacles to development. The nation's transportation, telecommunications, and power networks are ramshackle at best.

In addition, the old north-south split still manifests itself in an unequal level of economic activity in Ho Chi Minh City (formerly Saigon) and Hanoi, the capital. While in the south Ho Chi Minh City (HCMC) sprouts clusters of high-rises and buzzes with foreign investors and overseas Vietnamese, Hanoi moves at a more stately pace. The money and the nightlife are in HCMC, but Hanoi's slower economy has allowed it to retain its rich history of French colonial architecture and densely packed city streets.

Although the Vietnamese struggled as many of their neighbors got rich during the past decade, they may benefit from getting into the development game late. For example, they can see what happens when urban growth runs amok just by visiting places such as Bangkok and Jakarta.

"We want to extract lessons from other cities, so we can reduce the number of problems and the amount of time it takes us to develop," states Hoang Van Nghien, Hanoi's equivalent of mayor, whose official title is chairman of the Hanoi People's Committee. Chairman Nghien has traveled throughout Asia and spent time recently in Boston, where he was impressed by the city's ability to preserve historic areas while moving forward with modern development.

One of the lessons Nghien has learned from his travels deals with traffic congestion, an issue that his city will have to confront soon as more Vietnamese begin to buy cars. The only cities in Asia where traffic moves, says Nghien, are Rangoon in

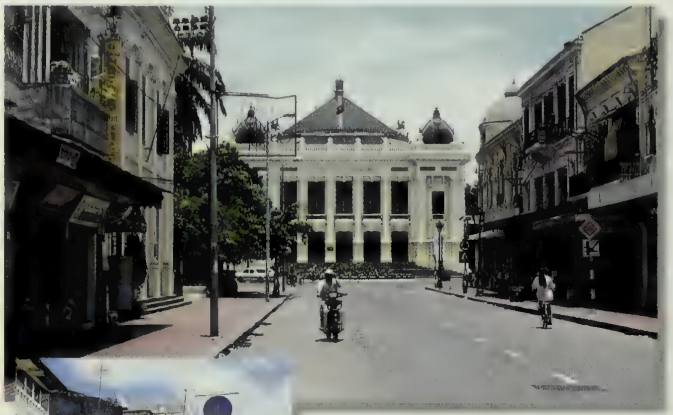


A recently approved plan for Hanoi calls for a new downtown north of the Red River (above and left).





By concentrating high-rise development in the new downtown, the plan will allow the existing city south of the river to retain its low scale and its blend of colonial-era avenues (above) and narrow streets (right).





Two faces of Hanoi: the recently renovated opera house (top) and an old street alive with bicycles (above).

Myanmar (formerly Burma) and Singapore. This is because "Rangoon is run by the military and Singapore has a good transit system," explains Chairman Nghien.

Hanoi is a special place. Decades of economic stagnation have left its historic "36 Streets" district intact, although most of the two- and three-story buildings there are badly in need of repair. The fast-beating heart of the city's old commercial area, the 36 Streets district actually has 78 narrow, crooked roads lined with shops on the ground floor and residences above. Plastic tables and chairs from makeshift restaurants spill out onto the sidewalk, where everything from traditional Vietnamese dresses to motorcycle seats is sold.

The value of history

The area is remarkable for being a distinct quarter, not just a collection of buildings. Fortunately, Hanoi's government understands the nature of its appeal and has established one of Asia's few historic districts as a way of protecting its character.

To the east and south of the 36 Streets is the administrative quarter where 19th-century French colonial authorities built tree-lined boulevards, stately mansions, and neoclassical civic buildings. The recently restored opera house (modeled after Garnier's in Paris) and dozens of ochre-colored administrative buildings are architectural souvenirs from Vietnam's colonial past.

Just as important as Hanoi's legacy of graceful buildings are the many parks and lakes dotting its urban landscape. Hoan Kiem Lake, for example, is a pagoda-and-temple-studded jewel right in the middle of the city. Much larger Ho Tay, or West Lake, is on the outskirts of the city's historic core and is a natural magnet for all kinds of hotels and recreational facilities. And nearly every neighborhood has at least a small park offering shade and a place to meet.

Towers cause alarm

In the last few years several high-rise office buildings have shot up in the center of Hanoi, breaking radically from the much finer scale and texture of their neighbors. Residents, architects, and government officials quickly realized these bland glass-and-metal towers were mistakes that should not be repeated. Slower economic growth than expected in the past two years may have led developers as well to see



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these high-rises as less than successful. As a result, new regulations restrict high-rise projects to just a few areas in town.

Hoping to avoid the errors of other Asian metropolises and to make the most of the city's assets, Hanoi officials started working about two years ago with a group of international consultants to develop a master plan that would guide the city to the year 2020. The group was led by Daewoo of Korea and included Bechtel; Skidmore, Owings & Merrill; Nikken Sekkei; Rem Koolhaas; and firms from Singapore, Malaysia, and Sweden. The plan was approved by the city and national governments this summer.

A new downtown

One of the key recommendations of the master plan was to develop a new downtown across the Red River from the existing city. By concentrating modern buildings in this new district (as well as a few other parts of the city), the planners hope to preserve the historic character of old Hanoi.

The master plan also calls for a new park along the Red River, greenways around the city, and establishing about 20 satellite towns within 20 to 30 miles of Hanoi to relieve the center city of some of its population pressures.

Hanoi currently has about 2.5 million people, according to Dao Ngoc Nghiem, deputy architect in chief for the city. But Hoang Van Dung, deputy secretary general of the Chamber of Commerce and Industry of Vietnam, notes that the city "was planned for a population of about 300,000."

The government's goal is to keep Hanoi's population at its current size while increasing the number of people living (and working) in satellite towns to 2 million, reports Nghiem. Each of the outlying areas would have a different focus and character, ranging from a university town to a high-tech center to a manufacturing hub.

A high birth rate and immigration of people from the countryside, however, could push Hanoi's population to 6 million by 2010, says Hoang. He also estimates that $50 billion of infrastructural development is needed in the city.

Looking at mass transit

Public transit in Hanoi is almost nonexistent. The beginnings of a light-rail system were abandoned a few years ago after planners and residents saw how much space it took up in the existing narrow streets. And the current bus system is so unreliable that very few people use it.

"In the next five years, we plan to build up the bus system so it handles 30 to 40 percent of the city's transportation," states Chairman Nghien. "We also hope to upgrade the railroad around the outskirts of the city and into the city center." A new ring road around the city is now being built by a consortium of foreign companies under a build-operate-transfer arrangement with the government.

Who will pay for all these improvements is a key question. Foreign investment in Vietnam has slowed down in the last two years and the Asian currency crisis now promises to delay large-scale foreign involvement even longer. The World Bank and the International Monetary Fund are helping to finance some infrastructure projects, but their scope is limited.

Some outside observers, though, are bullish on Hanoi. "The mayor is a farsighted guy; he has a vision for the city," says Robert Wolfgang, the director of the Office of International Trade and Business Development for the City of Boston, who has set up business exchanges between the two cities and started a "sister city" relationship.

"It's still very bureaucratic, but I didn't see a lot of mistakes in their plans," reports Homer Russell, director of urban design for the Boston Redevelopment Agency, who visited

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Modern towers in the center of town convinced the authorities to restrict where new skyscrapers may be built.

planners and government officials in Vietnam earlier this year. "They understand the value of what they have," says Russell, referring to the historic parts of Hanoi.

On the national level, Vietnamese officials are trying to put together plans that would allow for controlled growth over the next 20 years. Estelle Jackson, a Boston architect and planner, is working with the Boston Society of Architects and a team of international business experts to assist the Vietnamese in guiding development.

"We're recommending that the Vietnamese build their social and economic infrastructure before they start with all the physical stuff," says Jackson. New banking, monetary, and legal codes all have to be written before large-scale building begins, she argues.

More needs to be done

Douglas Peterson, U.S. ambassador to Vietnam, agrees that much work still must be done to create the right economic and regulatory conditions for future growth. "The lack of standards" in terms of building, banking, and legal codes "is one of the most serious issues facing the Vietnamese," says Peterson. "They need to build a reliable banking system that is accountable and auditable and to eliminate a lot of the governmental red tape."

Peterson says the Vietnamese have talked a lot about change, but haven't done enough. For example, he says, "Vietnam has about 6,000 state-owned enterprises, but only 15 or 16 have been privatized. They need to do much more."



The 36 Streets district is mostly intact, but buildings are in disrepair.

Binh Vinh, an architect in Philadelphia who was born in Vietnam and educated in France and the United States, shares many of Ambassador Peterson's views. "The fundamentals in Vietnam are still communist," states Vinh, who is design principal at Kling Lindquist Associates. "Some of the mid-level officials are trying to make changes, but they're not in charge yet."

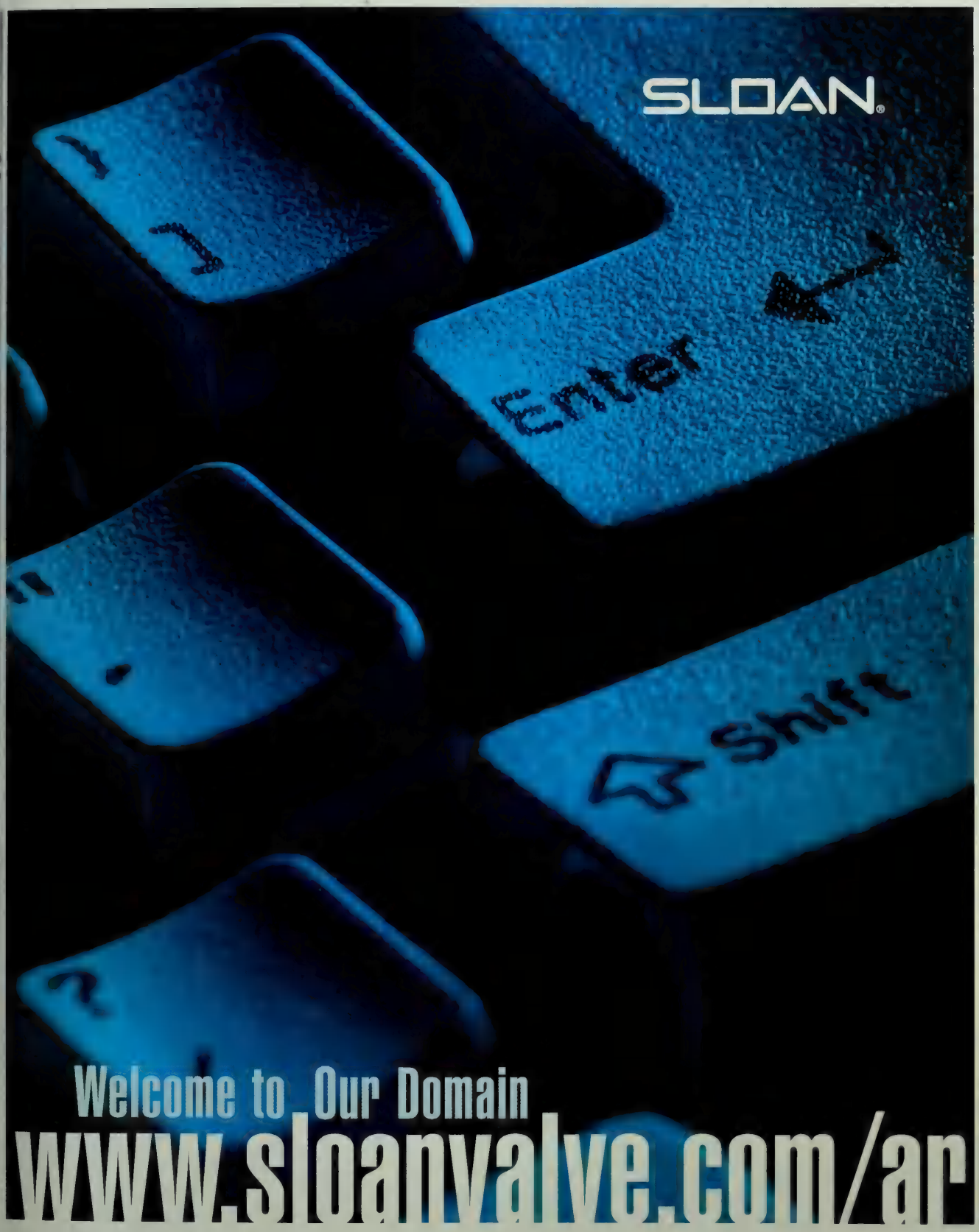
Hard to say no

Vinh gives Vietnamese officials credit, though, for learning from the mistakes of other Asian countries that let their cities grow without enough controls. Referring to officials in Hanoi, Vinh says, "They've stopped high-rises in the old city and set up development rules. So they're trying to do things right."

But, Vinh warns, "It's difficult to stop the tide of international finance and development once it starts. Money talks. Money is king. It's hard to refuse." Especially for a country as poor as Vietnam. ■



CIRCLE 18 ON INQUIRY CARD

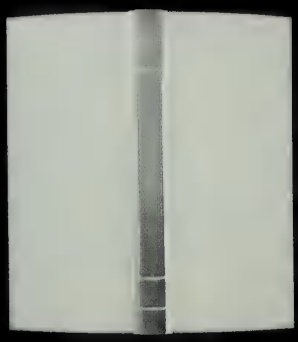


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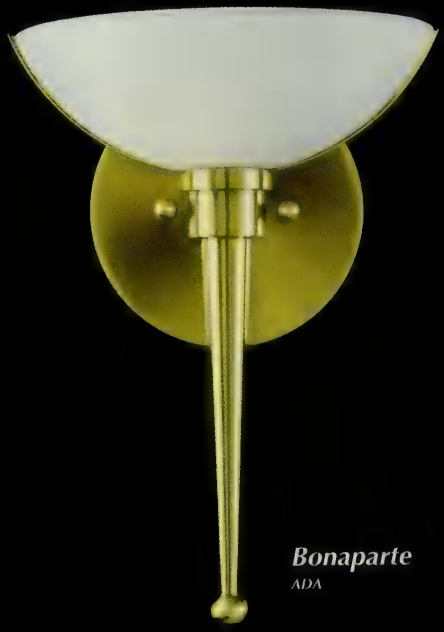
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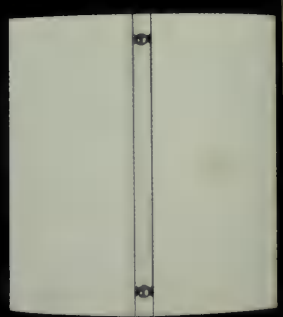
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CIRCLE 22 ON INQUIRY CARD

BOOKS Practice, practice, practice: three new books that attempt to help young architects along the path from education to the workplace.

BY JOHN E. CZARNECKI

Architect? A Candid Guide to the Profession (revised edition), by Roger K. Lewis. Cambridge: MIT Press, 1998, 304 pages, $17.

Professional Practice 101, by Andy Pressman. New York: John Wiley & Sons, 1997, 345 pages, $44.95.

Management for the Small Design Firm, by Jim Morgan. New York: Whitney Library of Design, 1998, 176 pages, $45.

For students and young practitioners, working in an architectural office for the first time can be a difficult adjustment. Professional practice courses do little to prepare students for the realities of practice and office management; only in the workplace can architects learn these lessons. Three recent books by practicing architects cover much of this ground for architects-to-be who are about to enter the profession: informing young people about architectural education, training students for the transition from formal education to practice, and helping to supplement the office experience.

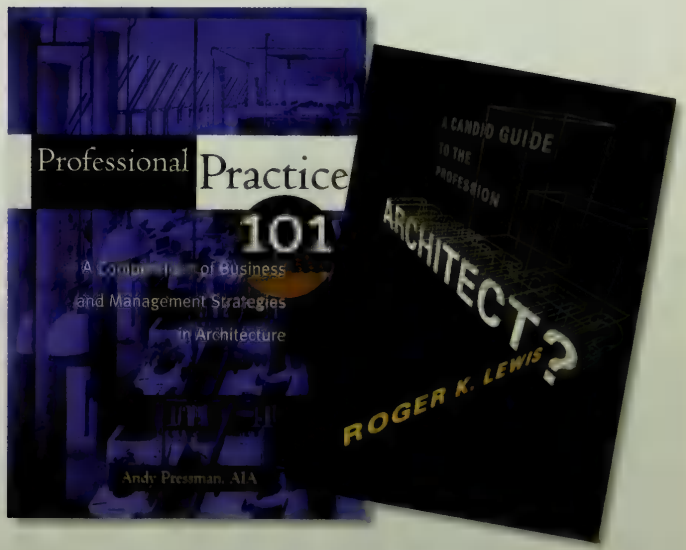
Originally published in 1985 and recently revised, *Architect? A Candid Guide to the Profession,* by Roger K. Lewis, is required reading for architecture students and interns. The new edition includes updated information as well as more illustrations, all drawn by Lewis, to complement the text.

When I first read the book as a freshman in architecture school, it gave me more insight into the education I was beginning and the profession I was entering than most of my professors could. As Lewis claims, *Architect?* provides "a candid account of the realities of becoming and being an architect." It defines the path to licensing and examines the architect's role in the building process.

Lewis brings a wealth of experience to this guide. A practicing architect in Washington, D.C., and a professor at the University of Maryland School of Architecture, he also writes a column on architecture, "Shaping the City," for the *Washington Post.* While *Architect?* is admittedly subjective, based solely on Lewis's expertise, his advice will serve most of his readers well on the road through architectural education and practice. And while the book's value to aspiring architects and architecture students is clear, it should also be read by practicing architects to affirm (or rethink) the reasons they entered the profession.

In *Professional Practice 101,* Andy Pressman, AIA, uses a range of experts to cover similar issues. Though the book's subtitle, "A Compendium of Business and Management Strategies in Architecture," may make *Professional Practice 101* sound deadly bland, Pressman's text, as well as the contributions from numerous practitioners and educators, delivers an engaging dialogue on the state of architectural practice. And while it's true that some of the essays are more gripping (or humorous) than others, the book's ideological neutrality allows it to serve as an effective catalyst for bridging the gap between education and practice.

The book begins, appropriately, with discussions of professionalism by three authors. The essays and interviews that follow, by Pressman and his contributing writers, cover subjects from firm typologies to project delivery to legal issues and nontraditional practice. In one evocative story, Michael Borowski writes about the contributions of David Wisdom, Louis Kahn's right-hand man, who spearheaded the production end of Kahn's practice. Anyone interested in teaching should read Stephen Dent's essay, which defines the stages and expectations associated with academia. Robert Douglass's account of



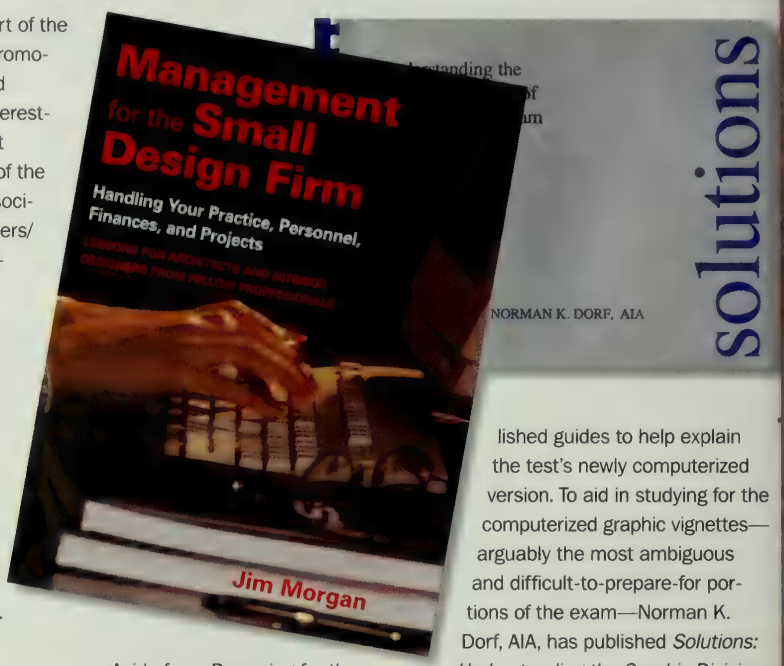
John E. Czarnecki is a former editor of Crit, *the national journal of the American Institute of Architecture Students.*

alternative careers is valuable in helping you discover if you're a "seeker" or a "solver."

An assistant professor of architecture and planning at the University of New Mexico, Pressman intended his book for students and intern architects. However, *Professional Practice 101* is equally, if not more, relevant to seasoned practitioners and educators.

Although it targets the same audience as Lewis's and Pressman's books do, Jim Morgan's *Management for the Small Design Firm* is not as engaging—a critical lapse when targeting a young audience. Morgan's book provides essential information on practice, but it is overly dry and lacks depth.

In the first four chapters Morgan covers a number of issues vital to beginning a practice: human resources, financial management, and project management and development. His lessons here are useful. However, in the final chapter, where small firms are profiled, what should be the most informative part of the book is little more than a promotion of Morgan's friends and colleagues. Although it's interesting to see the management styles of small firms, most of the firms profiled are either associated with Architects/Designers/Planners for Social Responsibility, of which Morgan is secretary, or have been associated with Pratt Institute, where Morgan taught interior design for more than 25 years. Because it lacks a conclusion and could use a broader range of profiles, *Management for the Small Design Firm* could have ended at chapter four.



Briefly Noted

Solutions: Understanding the Graphic Divisions of the Architect's Exam, by Norman K. Dorf. Published by the author, 1998, 135 pages, $40.

Aside from *Preparing for the Architect Registration Examination,* a book and video by the National Council of Architectural Registration Boards (NCARB), which administers the exam, there are few widely published guides to help explain the test's newly computerized version. To aid in studying for the computerized graphic vignettes—arguably the most ambiguous and difficult-to-prepare-for portions of the exam—Norman K. Dorf, AIA, has published *Solutions: Understanding the Graphic Divisions of the Architect's Exam.* The guide, which can be ordered at Dorf's Web site, http://members.aol.com/nkdorf, covers the site planning, building planning, and building technology

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divisions of the architects' exam.

A self-published effort, *Solutions* may lack the production quality of NCARB's manual, but because it provides a comprehensive view of the graphic divisions, it is worthwhile. Dorf has extensive experience teaching ARE preparation courses, conducting workshops, and writing and grading ARE questions. Using images taken from NCARB's sample problems, Dorf provides detailed, annotated illustrations of successful graphic solutions. His recommendations for accurate and complete answers to the exam's graphic sections, and his explanations of how each problem is scored, exceed similar information found in NCARB's guide. Although it should not be used as the only guide to prepare for the ARE, *Solutions* is a useful supplement.

Architectural Graphic Standards CD-ROM Version 2.0, edited by John R. Hoke Jr. New York: John Wiley & Sons, 1998, $395.

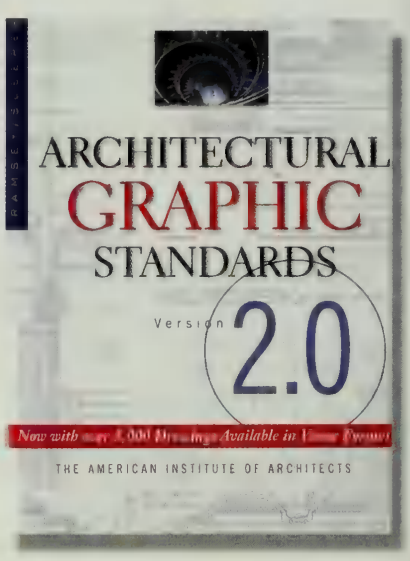
Just as CAD systems have replaced hand drafting in most architectural offices, the CD-ROM version of *Architectural Graphic Standards* (AGS), complete with links to industry Web sites, is also becoming an important tool for increasing efficiency in architectural practice. AGS Version 2.0, a PC-based CD-ROM, is a marked improvement over Version 1.0 and a necessary addition to every architect's desktop.

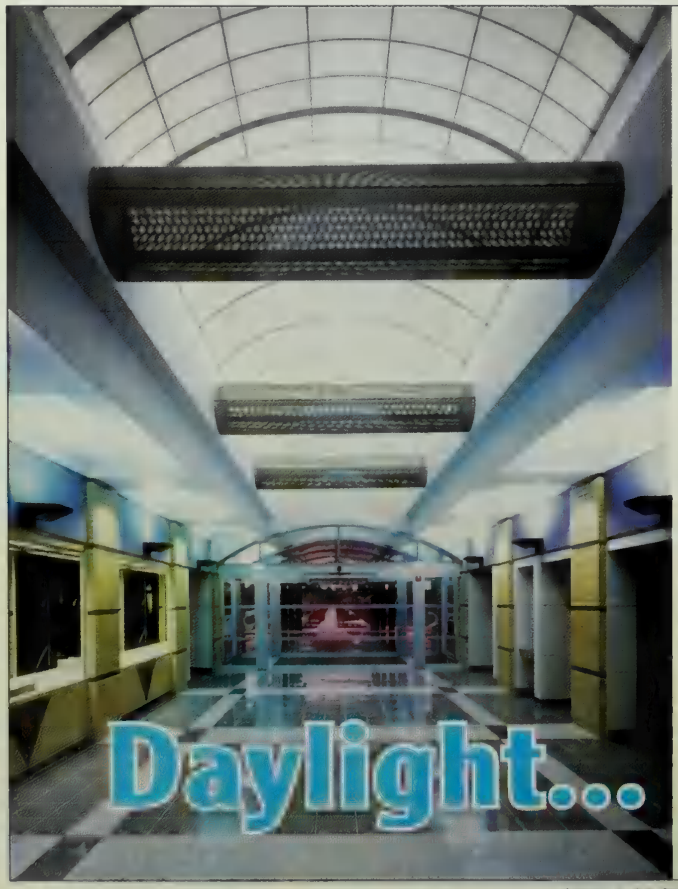
Version 2.0 contains more than 10,000 drawings, half of which are vector data drawings—five times as many vector data drawings as were included in Version 1.0. All the drawings can be copied easily into AutoCAD, Microstation, and most other CAD programs, as well as desktop publishing programs. The vector drawings' layers, accurate scale, and editable text remain intact when they are copied into a CAD program.

Among the important additions to Version 2.0 are direct links to more than 2,000 manufacturer Web sites and manufacturer profile pages on the Architects' First Source (AFS) Web site. Instead of paging through the AGS book and then finding the appropriate manufacturer information in various catalogs, architects can quickly access and download drawings and accompanying text if they have Web access. As new Web links become available, users will be able to download them from the John Wiley & Sons Web site. By fully implementing all the features of the AGS CD-ROM, production time can be decreased and accuracy of detail increased.

AGS Version 2.0 was edited by John R. Hoke, Jr., FAIA, the publisher of the American Institute of Architects Press and editor-in-chief of the eighth and ninth editions of *AGS.* The CD-ROM was developed by Jordani Multimedia of Minneapolis.

As with most Windows-based programs, you don't have to be a computer expert to retrieve and implement information from Version 2.0. It's well worth the price, especially for owners of Version 1.0, who can upgrade for $200. ■





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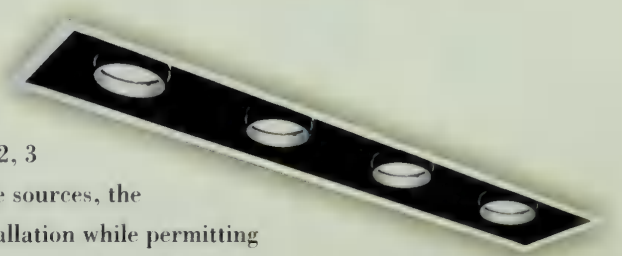
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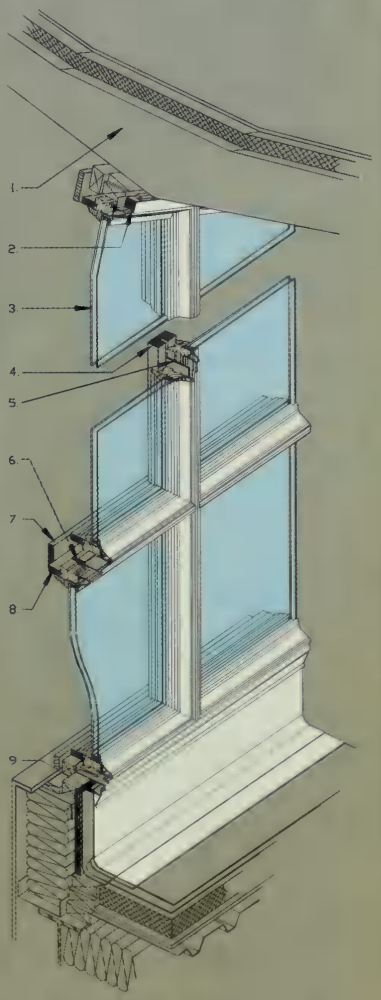




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TALLEST TOWER IN LATIN AMERICA IN THE WORKS FOR MEXICO CITY

Paul Reichmann, developer of Canary Wharf, the office campus that eventually revitalized London's Docklands, is now building the Torre Mayor in Mexico City, a 738-foot office tower that will be the tallest building in Latin America. The building will rise 55 stories above Paseo de la Reforma and Chapultepec Park. Its site lies between the city's historic district and the big hotels and corporate buildings of Polanco, an area that, despite its great location, has been in decline over the past few years.

The project teams Reichmann's International Property Corporation,



the developers and one of Canada's largest real estate organizations, with ICA, the largest construction company in Mexico, and Canadian architect Zeidler Roberts Partnership, best known for its high-tech structures for the Vancouver Expo in 1986. Architect Eberhard Zeidler also designed parts of Canary Wharf and buildings along the Paseo, among many commercial projects.

In his design for the Torre Mayor, Zeidler juxtaposes two vertical elements: one curved, green glass structure, opening out on multiple views, and a burnished granite structure with a rectangular floor plan. The most striking formal elements are the 60 degree diagonals that cut the glass volume at top and bottom. The glass body leaves visible the interior structure of the first 10 floors, emphasizing the entrance and paralleling the nine parking levels at the rear of the building.

The Torre Mayor will boast 800,000 square feet of column-free office space, while four underground levels and nine above provide 2,000 parking spaces. A 32,000-square-foot commercial area is planned for the entrance area, and a sophisticated foundation—outfitted with innovative shock absorbers capable of counteracting seismic effects—will support the steel structure.

In Mexico City, where accelerated growth has created a chaotic urban pattern, the Torre Mayor should help mark a central reference point. *Miquel Adrià*



HOLLYWOOD ON THE HUDSON: NEW YORK GETTING NEW STUDIOS

Though the days are long gone when New York was the capital of the film industry, production activity in the city has been on the rise lately. Now, a pair of projects—a film studio being built in the Brooklyn Navy Yard and a production studio in SoHo—could play a major role in attracting even more business to New York.

In June, New York Studios, Inc., signed a 70-year lease with the Brooklyn Navy Yard Development Corporation with the intention of building what it describes as the largest production facility outside Hollywood. If all goes as planned, the $160 million, 700,000-square-foot complex would sit on a 15-acre site in the Navy Yard. A predevelopment, conceptual design has been created by HLW International.

Across the river, Meridian Design Associates has completed its plan for Hudson River Studios (above), a complex that will be built on top of an existing building on West Street that was originally a rail freight facility. The project is budgeted at $120 million and slated for completion in January 2000.

The architects designed 310,000 square feet of new construction, including five television studios and post-production, office, and logistical spaces. Meridian put a premium on comfort in the proposed workspaces, including windowed, sunlit offices, terraces overlooking the Hudson, and an exercise room. *Soren Larson*

JOHNSON'S HOPEFUL DESIGN **Ground was broken in late July for Philip Johnson's Cathedral of Hope, being built in Dallas to serve the largest gay and lesbian congregation in the world. A 78-foot bell tower will be followed next year by a sanctuary, chapel, and cloister. A dedication is planned for the $20 million project on January 1, 2001. "I keep telling them to hurry up," says Johnson, who is 92 and openly gay. "Twenty million for a building like this is not expensive. Once people see it going up, they'll rush in to help complete it."**

Philip Johnson/Alan Ritchie Architects got the commission three years ago after senior pastor Michael Piazza was impressed by Johnson's Crystal Cathedral in Garden Grove, California. "We wanted a unique architectural statement," Piazza explains, "something both new and traditional, ancient even. We are not a New Age church."

The new cathedral will inhabit the same expressionist, biomorphic realm as Johnson's St. Basil's Chapel in Houston and the undulating visitor center at his estate in New Canaan, Connecticut. The main sanctuary will seat 2,500 and be framed by curving walls and sloping ceilings. However, the basic plan is conventional: altar, pews, choir loft, and a long center aisle.



A side chapel and a winding cloister will connect with the smaller, existing church, and the entire structure will be covered in synthetic concrete. "I'm doing real architecture again," says Johnson. "Churches and synagogues are the only buildings worth designing these days, unless of course I'm designing something for myself." ***David Dillon***

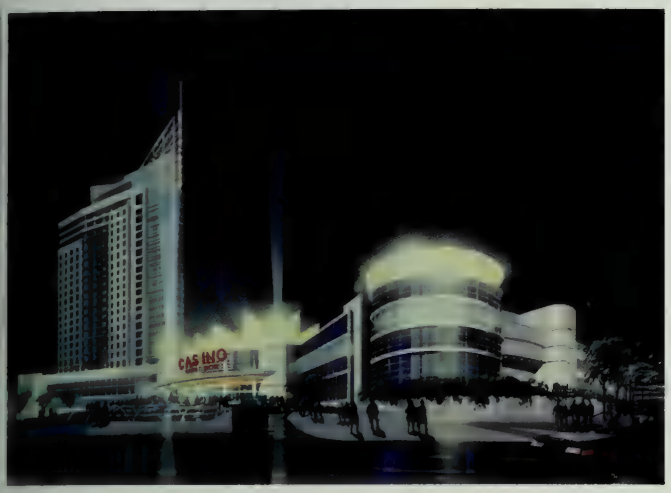


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LET THE GAMES BEGIN: ONTARIO BUILDS ON THE CASINO CRAZE

A somewhat restrained, Canadian version of a Las Vegas–style casino hotel opened this summer on the Windsor, Ontario, side of the Detroit River.

Casino Windsor's 100,000 square feet of gaming is crammed with 3,000 slot machines and 130 table games, and a video poker bar sits on the main floor of the 21-story, 389-room hotel. A temperature-controlled skywalk connects a 300-space parking structure to the casino and hotel, which has restaurants, bars, lounges, and an 11,000-square-foot ballroom. The silver and blue, concrete and glass complex carried a price tag of around $333 million.

The project was designed by the Webb Zerafa Menkes Housden Partnership (WZMH) of Toronto. Mel Glickman, one of the partners, says the nearby river strongly influenced the design, as illustrated by the 60-foot-high "water feature" that cascades three stories down through the atrium.

The landscaped site covers six city blocks. "From an urban design point of view, the casino is an anchor for a proposed major downtown redevelopment," Glickman says. There is another anchor in the works, a 34-story, 660,000-square-foot office tower, hotel, convention center, and parking garage now under active consideration by city council members—which WZMH also designed.

A second casino in Windsor is likely to be built, albeit on a smaller scale. Ron Barbaro, chairman of the Ontario Casino Corporation (OCC), the government agency that owns the province's three nonstop casinos, favors a second gaming venue on an adjacent government-owned site.

As many as 30,000 people a day packed the new Casino Windsor within the first five days of opening; with these numbers and a continual flow of revenues into provincial treasuries, it becomes not a question of whether a second casino will be built, but when and how big.

There has been little opposition to the idea, certainly not from political quarters. Windsor Mayor Michael Hurst actively lobbies for a second casino several blocks away from the new one.

He also calls for more family entertainment attractions and a convention center to help beat back competition from the U.S. side of the border. However, no commitments have been made.

And competition will arrive. Soon, Casino Windsor will face three neighboring casinos—with a combined 300,000 square feet of gaming space—that have been approved by Detroit's city council. *Al Warson*

TOUGH TIMES FOR WRIGHT HOUSES Fallingwater is not quite falling down, but structural analysis indicates that stress levels in Frank Lloyd Wright's famous cantilevered living room balconies have produced sagging—which could lead to a dire situation. As a result, the Western Pennsylvania Conservancy, which owns Fallingwater, has put a brace under the cantilever and is embarking on a restoration project. "The long-term prognosis? If untreated, [the house] will end up in the river," says Robert Silman, whose New York firm is the project's consulting engineer.

The first step was to put temporary steel shoring under the cantilever (shown below), as well as beneath the projecting rock of the waterfall below. The shoring does not carry any weight, but it prevents any further movement of the cantilever and will reduce stresses during the repair process.

The structure was analyzed using nondestructive pulsed radar and a three-dimensional computer model. Engineers determined that the primary cause of the deflection was the dead load of the inadequately reinforced structure itself—not snow, nor the hundreds of tourists who visit daily. According to Silman, Wright's ideas did not overreach the structural capabilities of the time—the cantilevers were underbuilt by the standards of 1936.

The eventual solution will likely be to take up the stone floor of the living room and insert pre-stressing members to reinforce three of the four main beams. The strategy will not eliminate the existing sag, because jacking up the building would cause extensive cracking. While the floor is removed, other mechanical and electrical renovations will be done as part of a larger program of repairs under a master plan by New York's Wank Adams Slavin Associates.

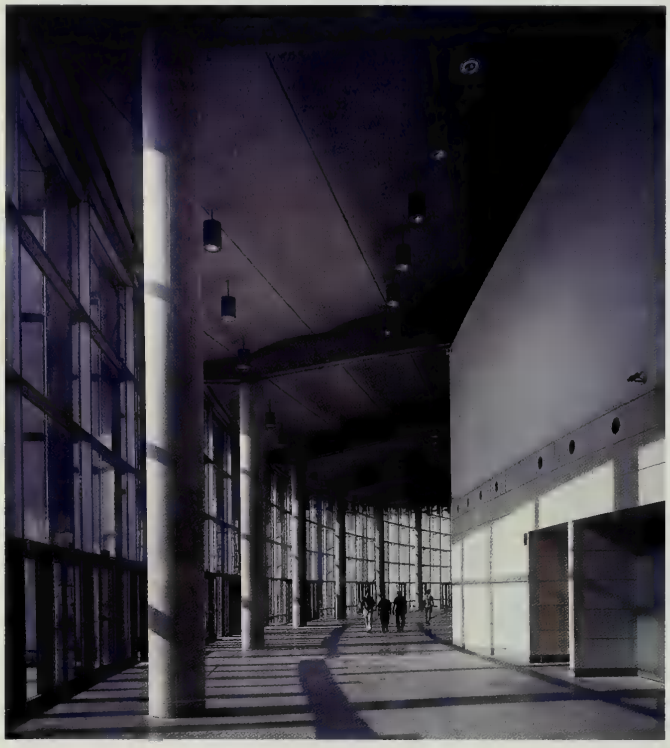


The conservancy plans a fund drive for the $6 million project and will host a forum in April to present its recommendations. Work will begin toward the end of the year, and the house will remain open.

Meanwhile, a wing of Taliesin, Wright's home and studio complex in Spring Green, Wisconsin, was damaged in June by a tree felled in a thunderstorm—ironically, a tree that helped serve as the architect's inspiration in designing the home. The century-old oak, which the house was built around in 1911, split and fell onto the roof of an area that Wright had used as his office and drafting studio.

Although the roof was crushed and windows were broken, the structure did not collapse and can be stabilized, according to the Taliesin Preservation Commission, which will now turn its attention to raising funds for a restoration.

The studio, in a section where the Wright Foundation now has its offices, had been left untouched by fires that twice destroyed the adjoining house, first in 1914 and again in 1925. *Jonathan Hale*



VALENCIA'S DEVELOPMENT PLAN STARTS WITH FOSTER'S CONGRESS CENTER

The Congress Center in the Mediterranean port city of Valencia, Spain, designed by Foster and Partners, is a deceptively simple structure.

As in other Foster works, the center's elaborate program is packed into a simple geometric shape, and the balanced, classical harmony of the exterior yields to a more dynamic interior distribution. The public areas and meeting rooms are developed in plan from the curving eastern facade as if they were following a distorted orthogonal grid, while the curving western wall cuts through this implied grid to define backstage service areas.

A zinc-coated aluminum roof soars over the lens-shaped plan, recalling the thin-shell concrete vaults of the 1960s and earning the center—which opened in July—the local nickname of *sardineta,* or little sardine.

The new building is located at the western entry to the city, in the center of a landscaped block that is the focus of a future zone of dense commercial development. The 167,000-square-foot facility was commissioned by the city and built on a tight budget of $33.3 million, or $200 per square foot.

Diez Cisneros was the local architect, Ove Arup & Partners was the structural and acoustical engineer, and J. Roger Preston + Partners was the mechanical engineer.

The team developed a high, wide lobby (above) that follows the long arc of the eastern facade, offering access to two maple-lined auditoriums seating 1,500 and 470 people, and to a multipurpose hall accommodating 250.

Between these volumes, stairs rise to nine seminar rooms, a restaurant serving 1,100, and other services on the upper level. The 650-foot eastern wall is glass, shaded by fixed vertical louvers of translucent stone.

A pool running the length of the base is designed to cool air drawn over the water into the lobby, cutting mechanical air-conditioning needs. *David Cohn*

MANHATTAN NURSING HOME ADDITION ADAPTS TO ITS SURROUNDINGS

When Geddis Partnership set out to design an addition to a nursing home in upper Manhattan, the firm wanted the new building to fit in with the traditional residences in the area. Design partner Barbara Geddis, FAIA, says she chose to "evoke the image of prewar luxury apartment houses on the Upper West Side, and in so doing, we thought to achieve a level of refinement usually not found in urban skilled-nursing facilities."

The $25 million, 88,000-square-foot addition to Amsterdam House consists of a 13-story wing fused to a nursing home built in 1977. The architects created a new lobby and common area, then connected the addition to the north with a senior day-care center housed in a restored 1880s waterworks structure.

The new structure's masonry is organized into a horizontal base and vertical tiers, a look in keeping with the neighborhood. The overall tones of the brick, windows, and precast elements are in tune with the palette of nearby Columbia University, and the interior is meant to be consistent with the original feel of Amsterdam House, founded as a nonprofit entity in 1872.

The continuous lower levels of all three structures host therapeutic services, ambulatory care, and social services. The upper floors include new semiprivate rooms for some of the 409 residents, as well as a dining room, nurse's station, and lounge. *S.L.*



DESIGNS FOR DOGS **Most dog owners don't put a lot of thought into the design of their animal's housing, but once a year they do have an opportunity to nab an architect-designed palace for their pet. At the annual Dog Day Afternoon fundraiser in St. Paul, Minnesota, to be held this year on September 27, the usual unusual array of architect-crafted doghouses will be auctioned to benefit DIFFA (Design Industries Foundation Fighting AIDS) and local humane societies.**

The event comes highly recommended from one of last year's participants, Bill Baxley, AIA, who was lead designer of a group from Bentz-Thompson-Rietow. Baxley, coworker Vesa Loikas, and the rest of the team "played around with the board-and-batten roof," Baxley says. They stretched heat-shrunk Dacron over part of the 10-foot-long, four-foot-high cedar dwelling, whose ramp expands the roof into a deck. There, a drainpipe directs rain into a wooden groove that terminates in a bowl (above). Another participant, Bill Blansky, AIA, entered a 30-inch-high, two-foot-wide dog bed shaped like "the quintessential doghouse" and covered in fake fur cut into designs recalling Mondrian and de Stijl.



Those interested in donating a doghouse for this year's auction should contact Randall M. Buffie, AIA, at 612/288-9800. *Janet Cass*


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MAYA LIN FINDS INSPIRATION IN THE ARCHITECTURE OF NATURE

Maya Lin is still best known for her first major commission, the Vietnam Veterans Memorial in Washington, D.C., but she hasn't let the ensuing pressure and notoriety cloud her creativity. Lately, she has produced a line of furniture for Knoll (see RECORD, June 1998, page 192), had her proposed design for a recycling plant and paper mill in the Bronx shown at the Municipal Art Society in New York, and pulled together her first one-woman travelling show, "Maya Lin: Topologies." The exhibition, a group of sculptures and installations, is at the Grey Art Gallery in New York through October 31 and will then hit Des Moines and Houston. Lin discusses her new work and the role of architecture in her art in the following interview.



RECORD: What triggers inspiration for you?

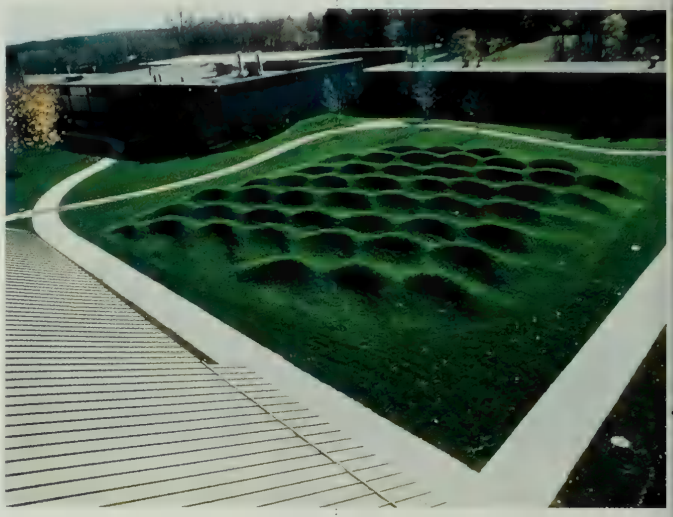
Lin: Anything and everything involving natural phenomena: a meteor shower, glacial patterns, sandiness. Nothing I do can be as beautiful as what naturally occurs, so what I'm trying to do with my work is to call attention to the articulations of the earth, views that might otherwise be missed.

RECORD: Could you comment on your use of mutable materials [wax, glass, plants] and randomness in your work?

Lin: My pieces are always about contradiction. I'm torn between Eastern and Western influences, so there's the yin and the yang, the hard and the soft. For instance, I've always been fascinated with the attributes of glass, that it's a solid that can look like water, that it's never stable. People often take for granted the incredibly complex curves in stones, in river-washed pebbles. I wanted to create these volumes that almost deny mass and weight. They're like drops of water sitting on the ground. Works like *Wave Field* [a field of grassy mounds inspired by ocean waves, shown at right] are going to require maintenance and are going to evolve. That they will fluctuate over time is intentional.

RECORD: Describe your creative process.

Lin: I try to let ideas percolate to the surface, not to force them. It might take me two to three years to develop an artwork. I try not to come up with one construct and then make the art around it, an approach that I think is encouraged in most architecture schools. I am interested in letting the process of making the work control it. In fact, my training as an architect was a difficult time for me. I think of all my work, be it a building or a sculpture, as art conceived intuitively.



RECORD: How is creating architecture different from creating art?

Lin: I couldn't do one without the other; the combination makes me whole. Sometimes the number of layers and levels involved in architectural problem solving exhausts me and I just want to simplify it. Often I think of what I do as similar to the approach of Frank Lloyd Wright: his vision of architecture transcended the structural envelope to embrace both the landscape outside and the furniture inside. For me, architecture is like a novel because it is a hierarchy of sentences expressing one theme, while art is like a poem, an idea reduced to its purest essence but still open-ended enough to convey a multitude of meanings.

Victoria C. Rowan

THE LAMINATE LIFESTYLE **"Most people laugh when they see the house," says independent design curator Grace Jeffers. "But then they spend some time there and start to understand its true significance." When the Ralph Sr. and Sunny Wilson House in Temple, Texas, was put up for sale last year, Jeffers approached Wilsonart—the plastics company Ralph Wilson founded in 1956—about saving it; the suggestion was quickly embraced. Ralph Wilson had commissioned the house—based on Richard Neutra's California houses of the 1940s and 1950s—in 1959 to use as a home and a place to experiment with plastic laminate. Once relegated to work surfaces and countertops, laminate was used by Wilson for furniture, shower stalls, interior walls, and even in the garage.**

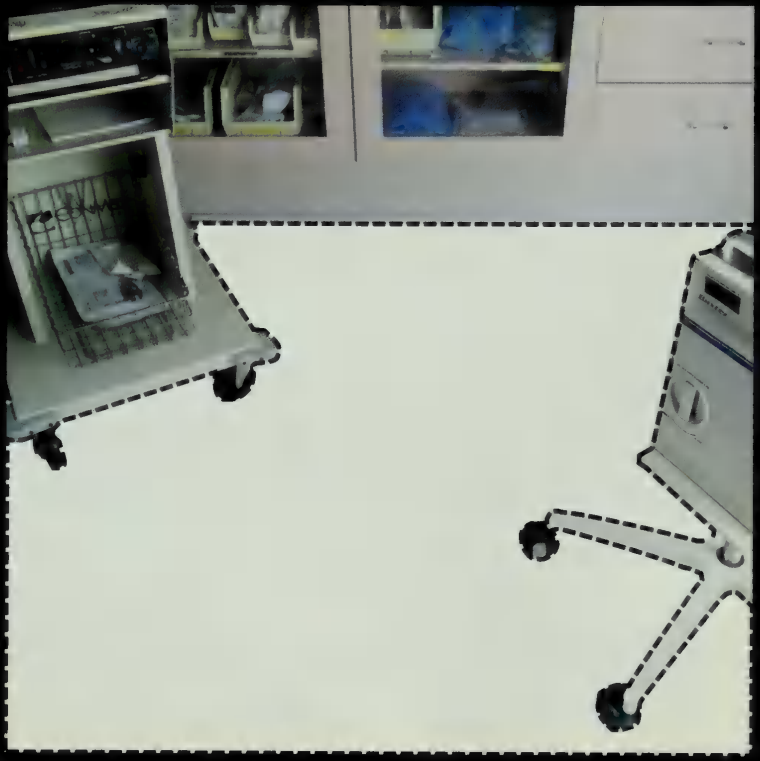


Most of Wilson's laminate innovations are now taken for granted. But the house, according to the Texas Board of Review, now stands as an icon of mid-century design. In fact, after it was recommended for the National Register of Historic Places, the Wilson House quickly received national landmark status in the categories of technology and architecture.

The house reflects an ideal of affordability and easy maintenance for the average American, a concept scholars often miss as they pay homage to high-style design. But Jeffers, also an adjunct professor at F.I.T., says that "if documents of culture are to be preserved, then the spectrum must be broadened to encompass examples such as this." Wilsonart plans to open the house to the public in November, when it will begin to host design exhibitions for—what else—the innovative use of plastics. ***Elana Frankel***

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AS HUNGARY EXPLORES AUTONOMY, LOCALS FEAR ANOTHER INVASION

Architects in Hungary, a country that over the centuries has been invaded by practically everybody in the immediate vicinity and some from beyond, are bracing for a new incursion from the West.

The Romans left amphitheaters, viaducts, and other mementos in the first century. Later, the Ottoman Empire held sway for 150 years and left tombs, baths, and onion-domed edifices as a reminder. Much of this became part of Hungary's architectural culture.

World War II left behind a lot of rubble, then the Russians came, stayed for 40 years, and departed, leaving a legacy of bland—if not outright ugly—buildings. Around two to three million Hungarians, or about 20 to 30 percent of the population, live in vast "Commie Condo" complexes (above), constructed of steel-reinforced concrete panels during the Russian presence.

Hungary is now a free-market country, struggling with the ramifications of capitalism and aspiring to become a member of the European Union. Fearing that designers from Western Europe and overseas—commissioned and brought over by multinational corporations and deep-pocketed real estate investors—will taint the country's architectural heritage, the Hungarian Chamber of Architects wants a bigger role in determining what will be built and how.

To this end, the 7,400-member group has drawn up a 12-point document urging the government to recognize architecture as an integral part of Hungary's culture and work in partnership with the chamber.

"We should be involved in all government decisions involving architecture, such as urban planning and housing," says chamber member Jozsef Finta, managing director of Finta and Associates Architect Studio, a professor of architecture, and a member of the Hungary Academy of Sciences.

Because nearly one-third of its membership is essentially unemployed or grossly underpaid, the chamber also wants restrictions on foreign architects until the country becomes part of the EU early in the next century. Until then, "foreign architects would be able to work here only if they are permanent residents and members of the chamber," says Ferenc Callmeyer, the organization's president.

He said the chamber is also interested in working with the government to design affordable, energy-efficient housing for middle-class families. This could be a major challenge; currently, single-family homes are primarily the domain of the old and new rich. Of the 22,000 single-family homes built in Hungary last year, approximately 27 percent cost HUF 100 million (approximately $950,000) or more. *Carl Kovac*

MODERN LOOKS JOIN ANTIQUES SHOW **For the first time, the prestigious Paris International Antiques Biennale, running from September 18 to October 4, will include modern furniture from as late as the 1950s, acknowledging a booming market for works of this period.**

Moving beyond Mies, buyers—the majority of whom are American—have discovered Charlotte Perriand, an early collaborator of Le Corbusier who is given co-credit for his famed chaise longue of 1928, and French engineer and architect Jean Prouvé ("kangourou" chair at right), among others. In addition, Gallery Yves Gastou is presenting furniture custom-designed by Marc du Plantier in 1936 for a Modernist villa just west of Paris, an illustration, says Gastou, "that there is still original furniture to be found."



A set of du Plantier stools is priced at $13,000, while a rationalist multicolored bookcase by Perriand, shown at the Down Town gallery in Paris, is tagged at $17,000. In comparison, reproductions of Rietveld's red and blue chair sell for about $1,400. ***Claire Downey***

GREENE & GREENE'S BLACKER HOUSE TO HOLD A TEMPORARY REUNION

Greene & Greene's fabled Blacker House, built in 1907, is about to be reunited with itself—briefly. During the first three weekends of October, the Pasadena, California, home will be open for self-guided tours as a fundraiser for its Pasadena sibling, the Gamble House, which Greene & Greene designed in 1908. For the festivities, the Los Angeles County Museum of Art, which owns the largest collection of original Blacker furniture, is lending its cache to the Blacker House's current owners, Harvey and Ellen Knell.

In 1966 the Gamble family gave their summer "bungalow," with its site-specific furnishings, to the city of Pasadena. Since that time, it has been administered as a museum by the University of Southern California's School of Architecture.

But the Blacker House (below), which at 12,000 square feet was Greene & Greene's largest commission, shared no such good fortune. In 1947 its furniture was put on the front lawn and sold. In 1985 lighting fixtures and stained-glass windows were stripped and sold at auction.

But over the last four years, the Knells have undertaken a restoration of the house, which in its heyday bordered on ostentation. They have commissioned meticulous reproductions of the 55 missing fixtures and windows. Rotted beams have been replaced, the physical plant updated, and ebony-detailed mahogany walls and herring-bone patterned oak floors refurbished. *Richard D. Mohr*



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NEWS BRIEFS

On a mission Gwathmey Siegel & Associates has been selected by the General Services Administration and the Department of State to be the architect for the new U.S. Mission to the United Nations, the firm's first project for the GSA. The 160,000-square-foot building, which will go up directly across the street from U.N. headquarters in New York, will include offices, a press room, a foreign affairs briefing center, an auditorium, reception rooms, and an apartment for the U.S. representative to the U.N. Construction of the mission will cost around $40 million and is expected to begin in early 2001, after the demolition of the existing facility.

One more try After many stops and starts over the years, New York's Metropolitan Transit Authority and mayor have agreed to sell the Coliseum site on Manhattan's Columbus Circle for development. Earlier designs had been vilified, and a plan by developer Mort Zuckerman fell through when the real estate market went bust, but officials are optimistic about the design by Skidmore, Owings & Merrill's David Childs for a development group headed by Time Warner and the Related Companies. The proposed building has an essentially Art Deco silhouette, with two towers dressed in glass. A jazz theater would hold the center of the complex, above a retail base and underneath apartments, a hotel, and Time Warner's offices.



SOM's new plan for a multi-use complex on Columbus Circle.

Unbuilt, not forgotten When Le Corbusier designed the master plan for the Indian city of Chandigarh, one of the highlights was the proposed Governor's Palace—a structure that was never built. Now, as part of a conference convening in January to celebrate the city's 50th birthday, a group called Chandigarh Perspectives is erecting a mock-up of the palace. The hope is to persuade the local authorities to finally realize the long-pending project.

Aalto's new look The Massachusetts Institute of Technology has begun a restoration and renovation of Baker House, the dormitory designed by Finnish architect Alvar Aalto. The 1949 building, whose wave shape is an icon along the Charles River, is one of just two permanent structures by Aalto in the United States. The $24 million renovation will replace all major mechanical systems and fully restore the building envelope, as well as restore primary features—such as the lounges and the dining pavilion—to Aalto's original specifications.

Memorial mess Another of the finalists bidding to design Germany's national Holocaust Memorial has dropped out of the process. According to German press reports, German artist Jochen Gerz withdrew because he doubts the much-delayed project will ever be built. Gerz's design envisioned 39 poles on which the word "why" would be written in the languages of the Nazis' victims. Earlier this year, American sculptor Richard Serra withdrew from the competition, although his collaboration with Peter

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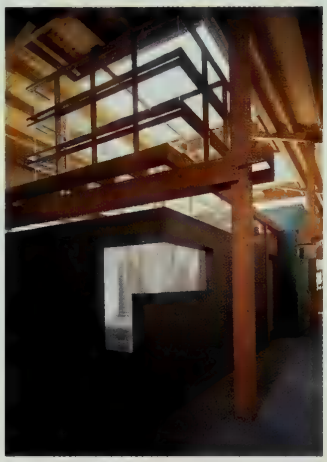
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Eisenman—a labyrinthine field of 4,000 pillars—is said to be favored by city officials. A design, which was supposed to be announced in March, had yet to be chosen at press time.

Safe design The recent bombings in Kenya and Tanzania raised questions about the security of U.S. embassies. Similarly, safety was the hot topic after the shooting at the U.S. Capitol this summer, and politicians have revived a proposal for a Capitol visitor center, which would exhibit Congressional doings while offering police additional time to scrutinize visitors. The holdup is money: building the center would cost as much as $125 million. The *Philadelphia Inquirer* reports that, among other options, Congress and the Architect of the Capitol will now reevaluate a 1995 design by Baltimore-based RTKL Architects.

Arts project The Minneapolis Institute of Arts has almost completed a 10-year, $150 million revitalization program involving the expansion of the McKim, Mead & White building that has been the institute's home since 1915. The project, overseen by RSP Architects of Minneapolis, increased museum space by 46,000 square feet, with 33 new galleries—including a new period room with a section of Frank Lloyd Wright's 1914 house in Deephaven, Minnesota—joining 74 renovated gallery spaces and expanded visitor services.

Speed trial Architects Pugh + Scarpa recently teamed with contractors and a client, Stoney Road Productions, to turn the interior of an earthquake-damaged structure in Santa Monica into a television and film production facility called Bedford Falls—in just 10 weeks. Construction began in the first days of the design process and the architects' drawings, drawn freehand, were combined as client-presentation and construction documents.



Bedford Falls was constructed at the same time it was designed.

Heery hears teachers Heery International, an architecture, engineering, and management firm, has undertaken a survey to find out what teachers would like to see in school design. Heery found that educators want fresh air and natural light, places for students to interact outside the classroom, a central display area for art and awards, and, in general, flexible, adaptable classrooms. Multipurpose "cafetoriums" were one of the most hated design features.

New folks' home The oldest permanent school of folk music in the United States, Chicago's Old Town School, is moving into a new structure this month. The $7 million Chicago Folk Center, designed by locals Wheeler Kearns Architects, features a 425-seat concert hall, group classrooms, private studios, and a library and resource center.

Mace, universal advocate Ronald L. Mace, who advised the Kennedy Center and the U.S. Holocaust Memorial Museum on accessibility issues, died June 29 in his Raleigh, North Carolina, home. Wheelchair-bound since contracting polio at age nine, Mace got his architecture degree at North Carolina State in 1966 and later founded its Center for Universal Design. ■

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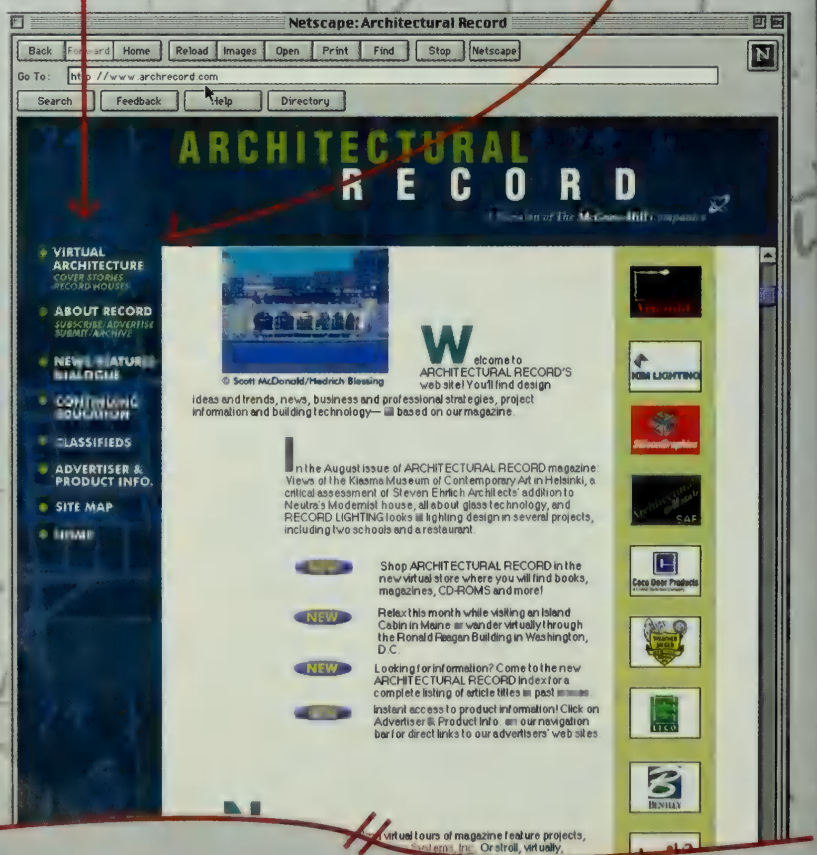
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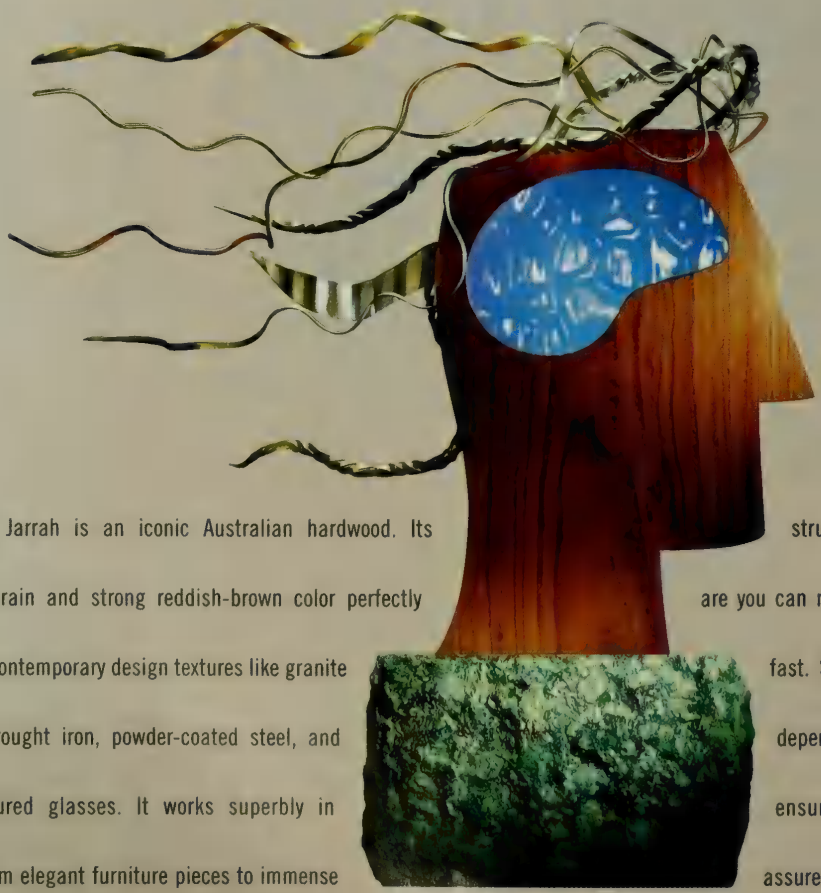






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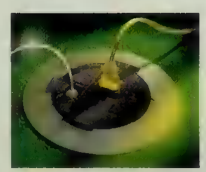
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DATES EVENTS

Calendar

National Design Triennial
New York City
Through September 12
A survey of developments in contemporary design, investigating how issues and ideas drive design practices in America. Cooper-Hewitt National Design Museum. 212/849-8300.

The Art of the Motorcycle
New York City
Through September 20
An exhibition exploring the motorcycle as both cultural icon and design and technical achievement, with an installation designed by Frank Gehry. 212/423-3840.

The Art of Architecture and Architecture in Art
New Orleans
Through September 20
This exhibition features architects' work in various art media and artists' work that incorporates an architectural sensibility. Contemporary Arts Center. 504/523-1216.

Tony Smith Retrospective
New York City
Through September 22
Works by the architect and artist, who trained under Frank Lloyd Wright and designed houses before turning to painting and sculpture. Several of Smith's monumental sculptural works will be installed at public sites throughout Manhattan during the exhibition. Museum of Modern Art. 212/708-9400.

Completing the Federal Triangle
Washington, D.C.
Through September 27
An exhibition documenting the recently completed Ronald Reagan Building and International Trade Center in Washington, D.C., by Pei Cobb Freed & Partners in association with Ellerbe Becket. National Building Museum. 202/272-2448.

Shifting Gears: In Pursuit of a Greener City
Toronto
Through September 27
An exhibition proposing urban design strategies for reducing carbon dioxide emissions. Design Exchange. 416/216-2145.

Fountains: Splash and Spectacle
New York City
Through October 11
This exhibition elucidates the role of fountains—and water as a design force—in defining urban space in Europe and America, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

Frank Lloyd Wright and the Living City
Weil am Rhein, Germany
Through October 11
An exhibition of Wright's schemes for Broadacre City, which attempted to erase the dichotomy between city and country. This is the most comprehensive exhibition in Europe of Wright's work to date. Vitra Design Museum. For more information, call 011/49/7621/702-33-51 or visit www.design-museum.de.

Walker Evans: New York
Los Angeles
Through October 11
While Evans is best known for his Depression-era photographs of the American South, this exhibition reveals the full range of his work as a New York street photographer, including some of his earliest and most abstract compositions. J. Paul Getty Museum. 310/440-7360

Do Normal: Recent Dutch Design
San Francisco
Through October 20
This exhibition of works by Dutch designers focuses on the centuries-old design consciousness that pervades every aspect of the country's culture. San Francisco Museum of Modern Art. 415/357-4000.

Design and Building of Gerard College
Philadelphia
Through October 23
Surviving entries in the 1832 design competition for the college, the first architecture competition to attract nationwide attention, are on display, as well as drawings of the construction of the winning entry, completed in 1848. Founder's Hall. 215/787-2601

Manchester: A Neighborhood Sketchbook
Pittsburgh
Through October 25
This exhibition of photographs, maps, and architectural drawings inaugurates the Pittsburgh Neighborhoods Project, an exploration of the city's rich diversity. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

Under the Sun: An Outdoor Exhibition of Light
New York City
Through October 25
An exhibition of solar-powered installations, including commercial products, experimental prototypes, and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

New Ways of Revitalizing the American City
Washington, D.C.
Through January 3, 1999
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

Robert Adam: The Creative Mind
Washington, D.C.
Through January 3, 1999
An exhibition of the work of the 18th-century Scottish architect, demonstrating his process of design from conception to final presentation. The Octagon. 202/638-3105.

Bechtel's First Century
Washington, D.C.
Through January 4, 1999
A portfolio of projects by the San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms. Highlighted "megaprojects" include the Hoover Dam, San Francisco's rapid transit system, and the Channel Tunnel. National Building Museum. 202/272-2448.

Louis Comfort Tiffany at the Metropolitan Museum of Art
New York City
Through January 31, 1999
Nearly 100 Tiffany works from the museum's collection, including windows, lighting fixtures, and objects, are featured. The full-scale entrance loggia from Tiffany's Long Island estate is also on view. Metropolitan Museum of Art. 212/570-3951.

Marion Mahony and Walter Burley Griffin
Sydney, Australia
Through May 2, 1999
This exhibition explores the professional and spiritual journey of Mahony and Griffin, from their years in Frank Lloyd Wright's office at the turn of the century through their work in Australia and India in the 1920s–30s. Powerhouse Museum. 011/61/02/217-0111.

Reconstructing the Aluminaire House
New York City
September 11–October 31
An exhibition celebrating Lawrence Kocher and Albert Frey's innovative 1931 structure, which is being restored and relocated to New York Institute of Technology's Central Islip campus. Architectural League of New York. 212/753-1722.

Rail-volution Conference
Portland, Oregon
September 12–16
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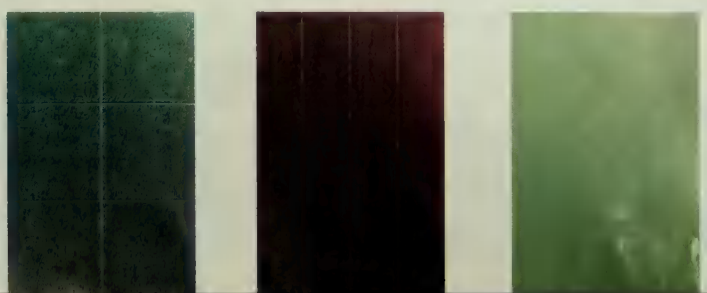
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transit coincides with the opening of an extension to Portland's light rail system. The conference offers the opportunity to explore living examples of the region's 25-year history of linking land use and transportation. Call 800/788-7077 or E-mail convene@aol.com.

Changing Cities: Strategies for Quality
Lisbon, Portugal
September 13–17
The 44th International Federation for Planning and Housing Congress focuses on recent changes in urban societies and strategic approaches to these changes, including both public and private initiatives. Centro Cultural de Belém. Call 011/351/1/793-26-68, fax 011/351/1/796-13-12, or E-mail ifhp98@mail.telepac.pt.

DOCOMOMO Conference
Stockholm
September 16–18
This year's conference of the International Working Party for the Documentation and Conservation of Buildings, Sites, and Neighborhoods of the Modern Movement focuses on the social aspects of modern architecture and urban planning. Swedish Museum of Architecture. E-mail marina.botta@arkitekturmuseet.se for more information.

Tensions in Architecture
New York City
September 16–January 5, 1999
This exhibition examines the extraordinary developments in the materials and technology of tensile structures. Material ConneXion Gallery. 212/445-8825.

The Triumph of Grand Central Terminal
New York City
September 23–November 11
A multimedia exhibition that includes photographs documenting the soon-to-be-completed restoration of Grand Central; historic photographs and news clippings; a video installation featuring views of the terminal from the "celestial ceiling"; and time-lapse photography of pedestrian traffic. Municipal Art Society. 212/935-3960.

All Wright: The Dana-Thomas House
Chicago
September 24–January 31, 1999
An exhibition showcasing the most complete and best-preserved example of Frank Lloyd Wright's early Prairie houses. Chicago Architecture Foundation. Call 312/922-3432 or fax 312/922-0481.

Equal Partners: Men and Women Principals in Contemporary Architecture
Northampton, Mass.
September 25–December 13
A celebration of male/female professional collaborations, featuring the work of 15 American firms founded and run jointly by men and women, including Arquitectonica, Asymptote, Hodgetts + Fung, and Tod Williams Billie Tsien Associates. Smith College Museum of Art. 413/585-2760.

Conference on J. B. Jackson and American Landscape
Albuquerque, N.M.
October 1–4
The goal of this conference is to provide the opportunity for an interdisciplinary assessment of cultural landscape studies, in addition to evaluations of Jackson's ideas and impact. School of Architecture and Planning, University of New Mexico. For information, call 505/277-3133, fax 505/277-0076, or E-mail schreib@unm.edu.

Competitions

Shinkenchiku Residential Competition
Submission deadline: September 10
Kyoto architect Shin Takamatsu will judge this year's ideas competition, sponsored by *Japan Architect* magazine. Winners' work will be published in the December 1998 issue of *JA*. To receive a copy of the rules, fax a request to 011/81/3/3811-0243.

AIA Continental Europe Design Awards
Submission deadline: September 11
Eligible projects are those built on the European continent and completed after January 1, 1993. For submission information, contact Frimmel Smith at frimmel@compuserve.com.

Union Internationale des Architectes Student Competition
Registration deadline: September 15
Submission deadline: January 31, 1999
Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. To register, call Liu Kecheng at Xi'an University, in Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn.

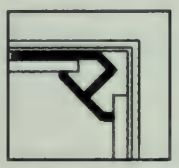
Wood Design Awards
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(continued on page 206)

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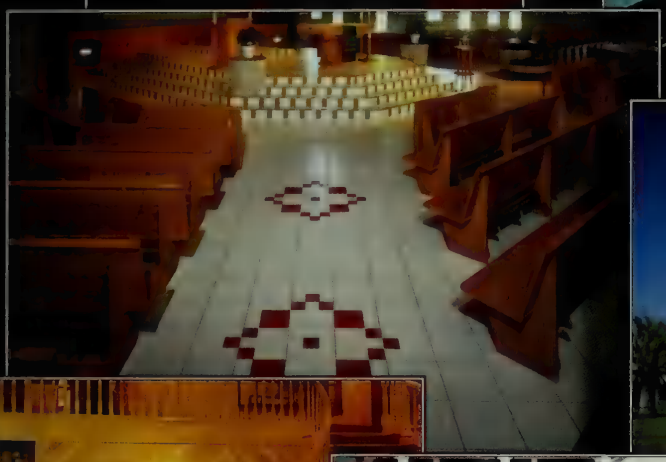
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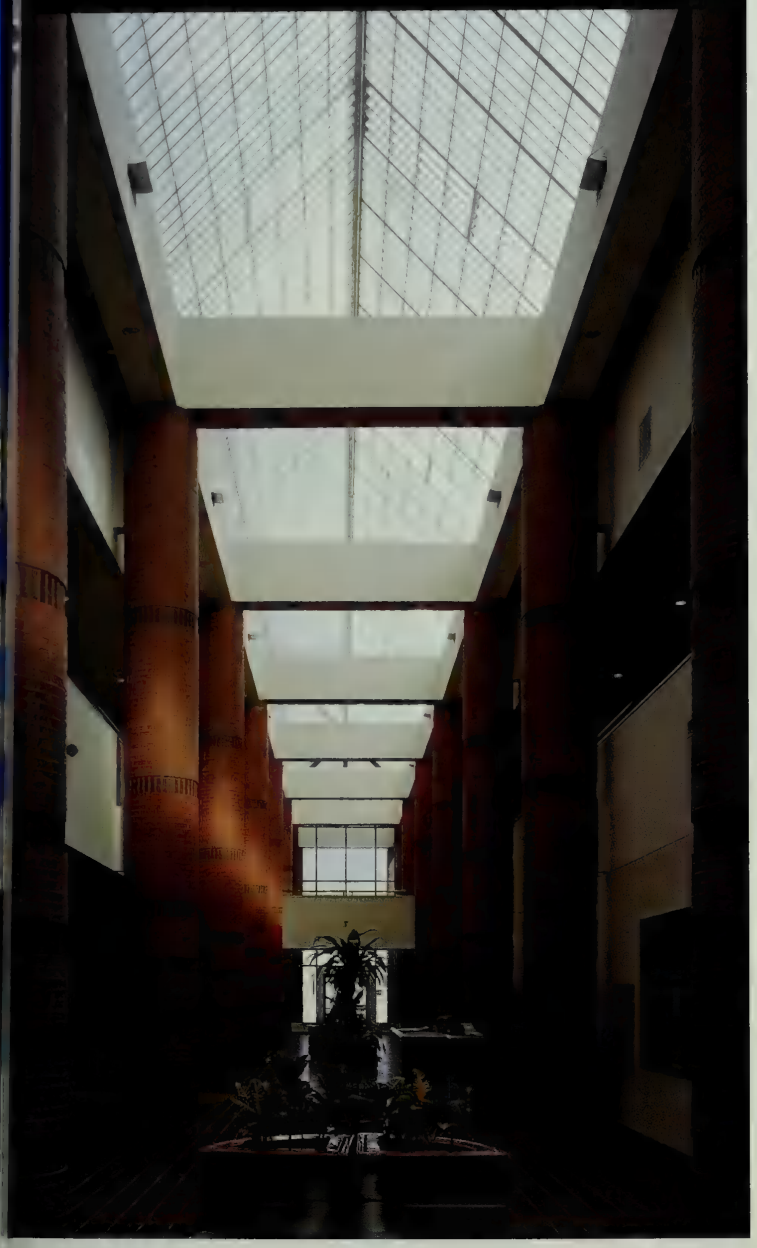
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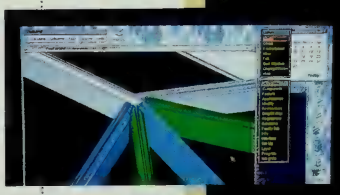
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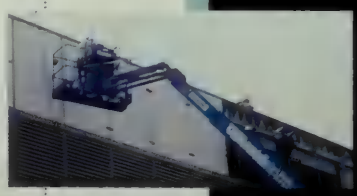
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Army General Headquarters,
Oscar Niemeyer, 1968.

Right: Planalto Palace (the executive building), Oscar Niemeyer, 1958. The sculpture in the foreground is *The Warriors* (1959), by Bruno Giorgi.

Below: A view from Planalto Palace to the towers of the Congress Building, Oscar Niemeyer, 1959.



Through the Viewfinder: Brasília's Modernism Emptied



In 1956 a new Brazilian government decided to realize a long-standing national fantasy to build a new capital city, Brasília, in the undeveloped Central Highlands. The expectation was that, as a geographic middle, the city would unify the country's disparate regions and provide a clean, rational, egalitarian, and modern example for crowded coastal Brazil and the rest of the developing world to follow.

Four decades later, many visitors to Brasília expect to hate the place. The taut, Corbusian Modernism of Lúcio Costa, the master planner, and Oscar Niemeyer, the architect of most of the buildings, is often perceived as vacuous and monotonous, despite Niemeyer's romantic forms. When photographer Todd Eberle went to Brasília, Carnival had emptied the government district of people, but he still did not find it desolate. Here he captured alien things—buildings and sculptures—active among great plaza voids. Eberle's images go on display at New York City's Robert Miller Gallery in March 1999. *David Simon Morton*

Government buildings behind the National Theater.





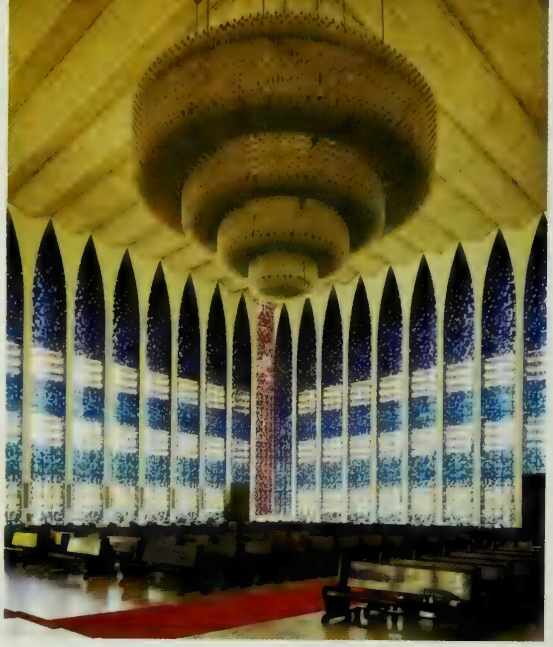
Brasília Room, Itamaraty Palace (the foreign ministry), Oscar Niemeyer, 1962. Roberto Burle Marx designed the garden.

Esplanade of Ministries,
Oscar Niemeyer, 1958.



Tancredo Neves Pátria
Pantheon, Oscar Niemeyer,
1985.

Dom Bosco Sanctuary,
Carlos Vasconcelos Naves,
1964.





Below and opposite bottom:
Itamaraty Palace,
Oscar Niemeyer, 1958.



SPECIAL REPORT:

South America's Building Boom



THREE COUNTRIES LEAD THE WAY TO ECONOMIC REVIVAL AND A LIVELY CLIMATE FOR DESIGN.

by Clifford Pearson

As the drumbeat of economic development sounds for South America, a new generation of architects (both local and foreign) is transforming skylines from São Paulo to Santiago. Since the Latin American debt crisis of the 1980s, governments throughout the region have slowly put their economic and political houses in order. Inflation and interest rates have been tamed, trade barriers reduced, and democratically elected leaders given mandates to reform sclerotic systems. Leading the way have been Chile, Argentina, and Brazil, which together account for 66 percent of the continent's population and are the key forces in the six-member Mercosur trading block, along with Bolivia, Paraguay, and Uruguay.

Of course, today's hot spot can be tomorrow's wasteland. Just a year ago, Asia's siren song still lured architects to Pacific shores, offering them the chance to design some of the world's tallest buildings, largest shopping centers, glitziest hotels, and biggest airports. "Fast, cheap, and out of control" is one way of describing what happened there. Now that many Asian economies have crashed, North American eyes are looking south. And what they're seeing is opportunity: demand is rising for modern development, an emerging middle class is providing new ballast for political systems, and rich cultures are providing fertile soil for talented native architects. So while experience in Asia has taught U.S. architects to be more cautious as they do business in South America, the construction market there hasn't been better in more than two decades.

BRAZIL, ARGENTINA, AND CHILE TOTAL MORE THAN 217 MILLION PEOPLE AND $1.25 TRILLION IN GDP.

Together the three countries profiled in this report have more than 217 million people and accounted for $1.25 trillion in gross domestic product (GDP) in 1997. Individually they present different business climates and economic conditions. Chile is farthest along the free-market road and the most U.S.-oriented, but it is also the smallest of the three countries, with only 15 million people. Argentina, which has 36 million people, enjoyed very strong growth in 1997 (GDP was up nearly 7 percent) and almost no inflation. But it is more European in its culture and trade focus, and the ruling Peronist party is losing much of its popularity. The biggest opportunities and risks lie in Brazil, which has a population of 166 million, many cultures, and a long history of economic volatility.

"While the immediate situation may fluctuate from time to time, the long-term prospects for Brazil and much of South America are a good bet," states Carlos Vega, an associate vice president of RTKL, which is working on retail, entertainment, and office projects in Brazil. "Throughout Latin America there is strong demand for large, mixed-use developments," he continues. But South American developers and architects don't have much expertise in these complex building types.

While at first glance conditions seem similar to those that had prevailed in Asia, veterans of both regions note important differences. "Asia is a much larger market and the rate of acceleration was greater there," explains Don Hackl, president of Loebl Schlossman & Hackl, a Chicago-based architecture firm. South America is closer to the United States geographically and culturally, and presents a simpler linguistic barrier—just two languages (Spanish and Portuguese).

Making friends for life

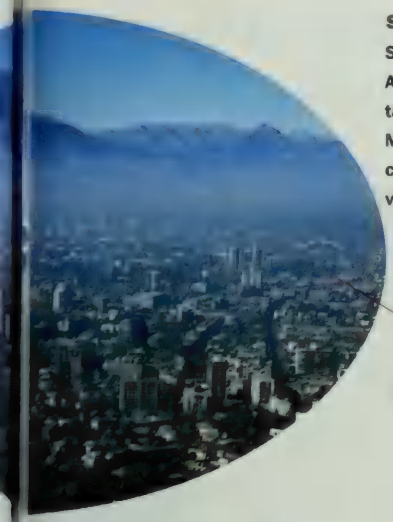
As in Asia, personal relationships are the key to business. "When a client hires you in South America, they're hiring a person, not a firm," explains Tom Porter, a senior principal at Thompson Ventulett Stainback & Associates (TVS), an Atlanta-based firm with several retail projects under way in Chile. "So it's essential to have the right people representing you. They must be senior-level people." RTKL's Vega agrees: "Business relationships last a long time in South America. If you deliver, you can have a client for life."

South American architecture firms tend to be different from the U.S. firms that do international work. Not only are they much smaller, but "they usually are generalists and don't have expertise in particular building types," says Hernando Gomez, the senior associate and coordinator for Latin American projects at VOA Associates, based in Orlando, Florida. Gomez, who grew up in Colombia, adds that it is important for U.S. firms to "build cultural bridges" with their colleagues in South America, so their designs are compatible with the way people live in these countries.

While U.S. firms almost always work with local architects, finding the right match is not always easy. "In South America they don't have the production-type firms" that can take charge of construction documentation and deal with local building authorities, says TVS's Porter.

Foreign architects must also respond to differences in local cultures and understand how these affect the way buildings are programmed and used. For example, people in Chile spend much more time on a trip to the mall than shoppers in the United States do. As a result, shopping

PHOTOGRAPHY: © ROBERT FREPCK (BUENOS AIRES); STEPHANIE MAZE (SAO PAULO)



Santiago, Chile
Set against the Andes, the capital boasts a Mediterranean climate and a vibrant economy.



São Paulo, Brazil
Brasília may be the capital and Rio the cultural hot spot, but São Paulo is Brazil's commercial hub.

Buenos Aires, Argentina
With a population of 8 million, this city is the political and commercial heart of the country.



centers have a greater mix of uses, often including space for community facilities and even medical offices, reports Porter. The same is true in Brazil, says RTKL's Vega, noting the large entertainment components and high-end restaurants found in Brazilian retail complexes.

Changes in the commercial real estate market

Due to the region's history of high inflation and currency fluctuations, real estate developers have shied away from committing large sums of money for any length of time. Most office buildings have been financed as condominiums, with the risk shared by the many individual investors buying space. But with growing monetary stability, the commercial real estate industry is becoming more like that in the United States and Europe. "New sources of money are coming in to finance larger projects," says James Diaz, a principal at San Francisco–based Kaplan McLaughlin Diaz (KMD), whose South American work has been centered mostly in Brazil. The growing sophistication of the commercial office building market in Brazil is resulting in more big-budget projects in which design is an important element, says Diaz.

Many of the U.S. architects interviewed for this article said their first contacts with South American clients were at conferences in the United States, and that making presentations at conferences is a good way of getting the attention of developers. Other firms like RTKL and KMD have followed U.S. clients to South America and then leveraged these projects to market their firms to local developers and businesses.

While the sound of collapsing economies in Asia has frightened many investors looking at emerging markets around the globe, South America still offers some big opportunities. "In the short term there are some real risks, but the long-term outlook for the southern cone of South America is favorable," reports Francisco Larios, senior emerging

NEW SOURCES OF MONEY ARE CHANGING THE WAY THE COMMERCIAL REAL ESTATE MARKET WORKS.

markets economist for Standard & Poor's DRI, an economic forecasting division of the McGraw-Hill Companies. The biggest question mark, he says, is Brazil and its ability to defend its currency in the wake of devaluations in Asia. If Brazil gets sick, it will certainly infect Argentina and to a lesser degree Chile (which has the most stable currency of the three countries).

Demand for buildings with international cachet and for complex structures like modern hospitals, however, is growing rapidly in South America. And much of the expertise needed to design these projects will come from U.S. and European architects. ■

CHILE WITH STRONG TRADE LINKS TO THE NORTH AND TO ASIA, CHILE AIMS TO BE A GATEWAY FOR TRADE.

Strategic vision: Having established free-trade agreements with Canada and Mexico, Chile is now aiming to join the NAFTA trading block. "Chile's goal is to become a financial capital of Latin America and a gateway to Asia," says architect Bernardo Urquieta, AIA, who was born in Chile and practiced there before moving to the United States.

Where the action is: The great majority of construction is taking place in Santiago, the capital, and the nearby city of Valparaíso. But activity is picking up in the north, where mining and other industrial operations are expanding; in the south, where fishing is growing; and in the central region, where wineries are becoming big businesses.

Construction outlook: The market for building products, a key indicator of construction activity, is expected to grow between 7 and 10 percent annually for the next five years. Housing has been a particularly strong part of this story, averaging 11 percent annual growth over the last 10 years. In 1996 a total of 141,000 dwelling units and 98.2 million square feet of housing were built, annual increases of 4.0 percent and 7.1 percent, respectively. In Santiago, demand for international-quality office space is soaring and supply has yet to catch up. "The vacancy rate for Class A office space is very low," according to Daniel White, an associate principal of Perkins & Will, who had worked on South American projects for NBBJ. Retail complexes, especially high-end shopping centers, are also hot; many U.S. architects are working on these projects.

Raising the bar: "Chile is changing into a postutilitarian society," states Urquieta, explaining Chileans' growing demand for higher standards of design and living. This is creating an opportunity for local and foreign architects to design buildings that meet international standards and have greater amenities. The level of engineering is already very high, says Tom Porter, a senior principal of Thompson Ventulett Stainback & Associates. "In many cases they're ahead of us," he adds.

Economic overview: Chile boasts one of the healthiest economies in South America, with a high savings rate and low foreign debt. But it is also one of the most exposed to problems in Asia, having built up strong trade relations with Pacific Rim countries. Standard & Poor's DRI reports that in the first two months of 1998 exports to Japan fell 25.4 percent and those to Korea dropped 75 percent. While last year there were fears of an overheated economy, fallout from the Asian flu—including sagging exports and higher interest rates needed to defend the Chilean peso—has pushed the nation into a lower gear. DRI predicts growth will slow further in 1999 to 3.9 percent but will pick up in 2000 if Asia rebounds.

Political situation: Since General Augusto Pinochet handed over power to civilian leaders in 1990, Chile has had one of the steadiest democracies in Latin America. Tension between the military and civilian politicians, though, flares up on occasion, such as in March when Pinochet retired as head of the army and took a seat in the Senate.

Contacts: * Colegio de Arquitectos de Chile (Chilean Architects Association), Rene Morales, president. Tel. 56/2/639-8744, fax 639-8769. * Cámara Chilena de la Construcción (Chilean Construction Chamber), Hernan Doren, president. Tel. 56/2/233-1131, fax 232-7600.

Population: 14.9 million

GDP, 1997: $80.58 billion

GDP growth, 1997: 7.1 percent

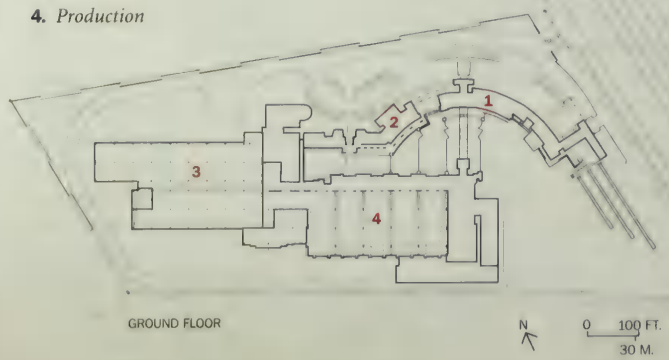
GDP growth forecast, 1998: 5.2 percent

Inflation, 1997: 6.2 percent





1. *Administration*
2. *Employee services*
3. *Warehouse*
4. *Production*



Alusa Printing Company Headquarters
Santiago
Architects: *Bru Architects—Bernardo Urquieta, AIA, Renzo Zecchetto, AIA, principals*

Set on the outskirts of town, this complex includes offices, printing, storage, dining, and recreational facilities. Gardens and courtyards surround the buildings, creating a strong relationship between indoors and out.







PHOTOGRAPHY: BRU ARCHITECTS (THIS PAGE, TOP); © PIOVANO (OTHER)

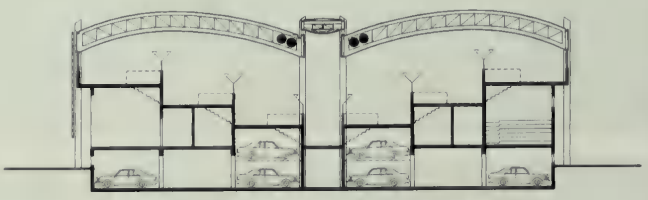
Prolam Building
Santiago
Architects: *Juan Ignacio Baixas and Enrique Del Rio (Victor Hugo Franzani, assistant)*

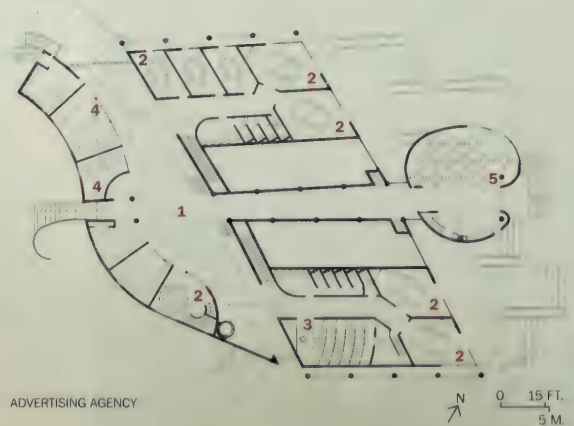
Designed as the Chilean office of the large advertising agency Young and Rubicam, this building provides separate areas for business and creative staffs while establishing a dramatic central atrium that serves as a unifying element for the entire company. The poured concrete structure also includes a curvilinear dining area and parking spaces below the offices. Landscaping helps contrast the built realm from the natural.





1. *Reception*
2. *Conference*
3. *Auditorium*
4. *Office*
5. *Dining*

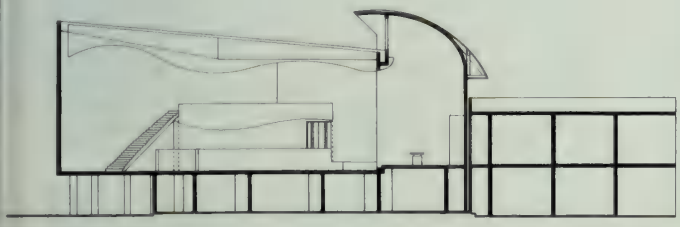




ADVERTISING AGENCY

Chapel of Villa Maria School
Santiago
Architects: *Enrique Browne and Mario Pérez De Arce; Ricardo Judson, associate architect; Jaime Irarrázabal, Patricio Sancha, collaborators*

An addition to an existing school, this project includes administrative offices on the ground floor and a chapel above. The architects used simple materials and incorporated ribbons of daylight to animate the sanctuary. A curving ramp creates a sense of procession as one moves into the space. The project also included a gymnasium (not shown) at the other end of the school.



ECTION THROUGH CHAPEL

0 15 FT.
5 M.





ARGENTINA ARCHITECTS BUILD ON A TRADITION OF URBANISM AND DESIGN THAT ADDS TO THE PUBLIC REALM.

Old world ties: Foreign architects often describe Argentina as the most "European" of all South American nations, referring to both the country's architectural heritage and its people's attitudes. With its broad avenues and eclectic mix of neoclassical apartment buildings and storefronts, Buenos Aires has much the feeling of Madrid or Paris. Construction and building practices, along with building and engineering standards, tend to follow European models rather than American ones.

Urban culture: "There is a concern for urbanism in Argentina," says Jose Caban, AIA, chair of the school of architecture at Clemson University in South Carolina. "Architects there talk of buildings that preside over open space, that lend presence to the public realm rather than refer just to themselves."

Where the action is: With more than 8 million people and its status as the nation's capital, Buenos Aires is by far the largest building market. The next most important cities are Córdoba in the north central part of the country and Mendoza in the west central.

Construction market: Until the economy began to slow down earlier this year, the Argentine market for building products and supplies was growing at a 10 percent annual clip. Demand for housing has been particularly strong, with a national housing "deficit" of 2.5 million units. This has led the federal government to announce its intention to build 100,000 low-cost units each year from 1997 to 1999.

Economic overview: Argentina led all of Latin America last year in terms of GDP growth with an 8.4 percent surge. The first quarter of 1998 was another strong period. But the Asian economic crisis has frightened many investors from all emerging markets and has cast a large shadow on Brazil, which buys approximately 30 percent of Argentina's exports. As a result, the country's current-account and trade deficits have grown and the government has begun to cut spending. With a slowing economy, the Merval stock index declined 18 percent in the first half of 1998. Inflation is low, but real interest rates are high, as is unemployment, which remains above 13 percent. While there are problems with the Argentine economy, it should bounce back starting next year, says Francisco Larios, senior emerging markets economist at Standard & Poor's DRI. "There are some questions about the level of bad loans at some small and medium-size banks, but the banking system as a whole is more transparent and stronger than it was before a series of reforms was instituted in 1995," adds Larios.

Political situation: After making noises that he might try to amend the nation's constitution to allow him to run next year for a third term, President Carlos S. Menem has said he will not run again. Persistent high unemployment and stories of corruption had reduced his popularity rating to 20 percent, making a third victory questionable anyway.

Contacts: * Sociedad Central de Arquitectos (Central Architectural Society). Tel. and fax 54/1/813-6629. * Consejo Professional de Arquitectura y Urbanismo (Professional Council on Architecture and Urbanism). Tel. 54/1/811-1068, fax 812-6573. * Cámara Argentina de la Construcción (Argentine Construction Chamber), Aldo Benito Roggio, president. Tel. 54/1/361-8778, fax 361-4724

Population: 36.1 million

GDP, 1997: $309.5 billion

GDP growth, 1997: 8.6 percent

GDP growth forecast, 1998: 4.8 percent

Inflation, 1997: 0.5 percent





Novartis Headquarters
Buenos Aires
Architects: *Aslan y Ezcurra Arquitectos—Jorge Aslan, Lorenzo Gigli, Alejandro Madero, Oscar Carattini, Marta Aslan de Gigli, Juan Carlos Demdemian*

An addition to and renovation of an existing Corbusian-style office building from 1960, this project connects old and new by means of a metal-and-glass atrium. In addition to the new central hall (above), the 45,000-square-foot extension includes new offices, conference rooms, auditorium, dining area, and parking.



Dock 7 at Puerto Madero
Buenos Aires
Architects: *Baudizzone-Lestard-Varas Arquitectos*
Collaborators: *Donoso, Ledesma y Gradel*

The architects converted a large brick warehouse into a mixed-use building with retail space on the ground floor and lofts above. The warehouse is one of 16 such structures built at the turn of the century as part of a new port for the city.





Dock 8 at Puerto Madero
Buenos Aires
Architects: *Baudizzone-Lestard-Varas Arquitectos and Bilik/Szwec y Fryd Arquitectos*
Collaborators: *Flavio Janches, Marcelo Izraelewicz, Fernando Iglesias Molli, Alejandro Delisio*

Echoing the massing of the old warehouses nearby, this new 216,000-square-foot structure brings together commercial and residential uses. The architects reinterpreted turn-of-the-century industrial architecture in a modern way and incorporated a riverfront esplanade, balconies with generous glazing facing the water, and rooftop terraces.



BRAZIL GROWTH IS SPREADING FROM RIO AND SÃO PAULO TO A SECOND TIER OF CITIES.

Not just the usual suspects: The largest country in South America, Brazil is also one of the most urban, with 71 percent of the population living in cities. São Paulo has 15 million people and construction is booming. Rio de Janeiro buzzes with 9.8 million inhabitants and is busy adding to its stock of large buildings. But there are a number of secondary cities that are significant markets in their own right and should not be overlooked—places such as Belo Horizonte, with 3.4 million residents; Porto Alegre, with 3 million; Recife, with 2.8 million; and Brasília, with 1.6 million. "I was amazed at how many big cities Brazil has," recalls Juan Diego Perez Vargas, director of Latin America for Kaplan McLaughlin Diaz (KMD). "We've been totally absorbed by São Paulo and Rio, but there's a lot of building going on in these other places," adds Perez Vargas. U.S. firms are starting to take notice; for example, KMD has industrial projects under way in Campinas, VOA Associates a large conference center in Curitiba, and RTKL a three-tower complex in Recife.

Construction market: The market for building products in Brazil in 1997 was $24.4 billion and grew 11 percent. Higher interest rates this year, due to the Asian economic crisis and pressure on the Brazilian currency, is taking some steam out of the building sector. But Standard & Poor's DRI expects the construction market to grow at an average rate of 10 percent a year until the end of the century, in part due to the recently approved Real Estate Financing System, which will establish a secondary mortgage market and provide more funding for development projects.

Residential construction: Housing is critical in Brazil; 5.5 million new units are needed and another 5 million are in need of extensive repair. Federal programs such as "Habitar Brasil" aim to alleviate the problem by building 102,000 houses in 1997–98 for families with monthly incomes of less than $300.

Other sectors: Although commercial construction has been strong in the last few years, 77 percent of the office buildings in São Paulo are more than 25 years old and are not equipped to handle the computer and electrical needs of modern corporations. So demand for Class A office space remains high. In the retail sector, Brazil has 128 major shopping malls; but experts say the country could use another hundred. Growth in tourism should also continue and the Brazilian Institute of Tourism expects $5 billion of investments in this sector over the next two years.

Economic overview: Economic growth will slow significantly this year, from a previous estimate of 4.4 percent to just 1.1 percent, due to the Asian crisis and a loss of investor confidence in emerging markets in general. To protect the value of the *real*, the central bank raised reference interest rates to 43.4 percent at the end of 1997. The move seems to have worked and interest rates have come down this year, but unemployment has risen to over 8 percent. This year's pain, though, may set the stage for renewed growth next year.

Contacts: * Instituto de Arquitetos do Brasil (Brazilian Institute of Architects), Pedro Antonio Galvao, president. Tel. 55/27/227-9823, fax 225-3250. * AsBEA (Brazilian Association of Architectural Firms), Edison Musa, president. Tel. 55/11/822-2982, fax 822-4589.

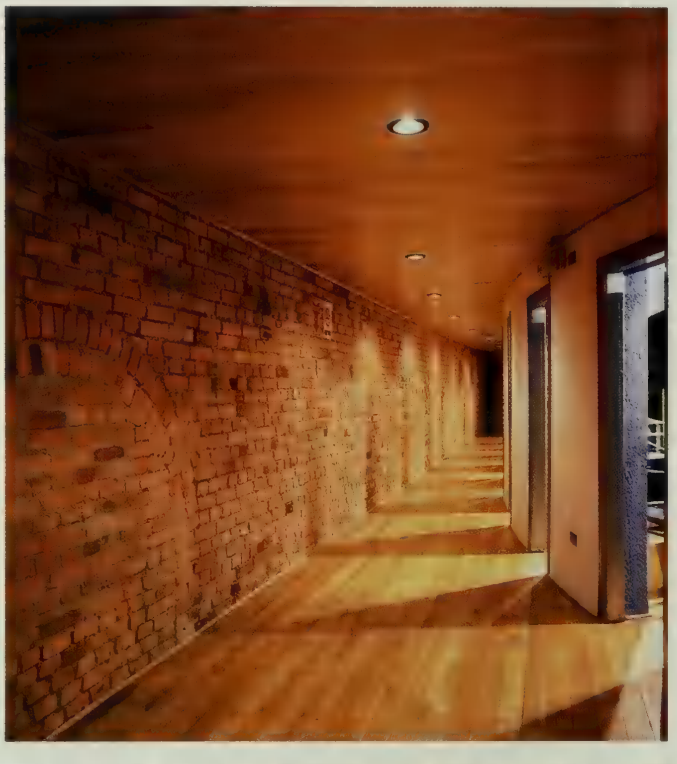
Population: 166.5 million

GDP, 1997: $855.0 billion

GDP growth, 1997: 3.7 percent

GDP growth forecast, 1998: 1.1 percent

Inflation, 1997: 8.3 percent









Restoration and Renovation of the Teatro Polytheama
Jundiaí
Architects: *Brasil Arquitetura—Francisco de Paiva Fanucci, Marcelo Carvalho Ferraz, Marcelo Suzuki, André Vainer*

After opening in 1897, the Teatro Polytheama provided residents of Jundiaí, a city 30 miles northwest of São Paulo, with popular entertainment on stage and a Beaux-Arts landmark downtown. In the 1970s, the theater went out of business and was abandoned. A comprehensive renovation, completed in 1996, brought the 34,000-square-foot theater back to life.





Atrium III Building
São Paulo
Architects: *Aflalo & Gasperini Arquitetos—Gian Carlo Gasperini, Luiz Felipe Aflalo Herman, Roberto Claudio dos Santos Aflalo Filho*

Located in Villa Olimpia, once a mostly residential neighborhood, this 108,000-square-foot office tower opens to the narrow streets with a large glass entry hall. Plantings inside and an adjacent garden offer touches of green in what is now a heavily developed part of town.

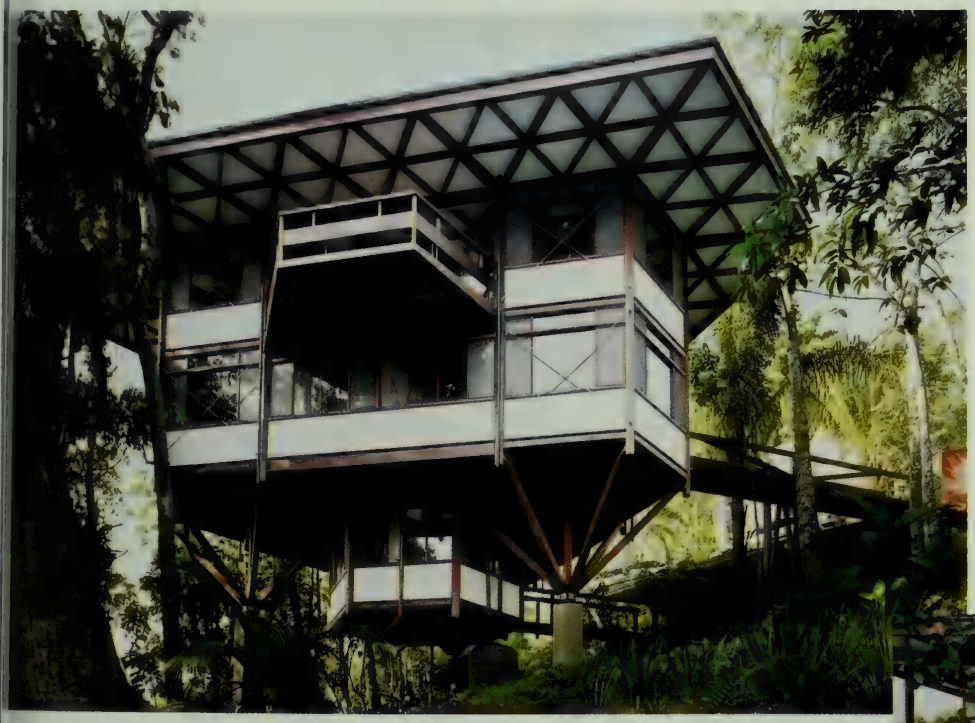


Leila Pace Gallery
Belo Horizonte
Architects: *Gustavo Penna Arquiteto & Associados—Gustavo de Araújo Penna, Alexandre Bragança de Matos, Alessandra Rodrigues, Fernando Arruda, Norberto Bambozzi, Priscila Dias de Araújo*

This 2,500-square-foot gallery provides one large space and a mezzanine for the display of art. The straightforward design, along with simple materials and a bold use of color and light, creates a proper setting for art. A few strong gestures, such as a ramped entry path and a long skylight, complement the simple building shell.

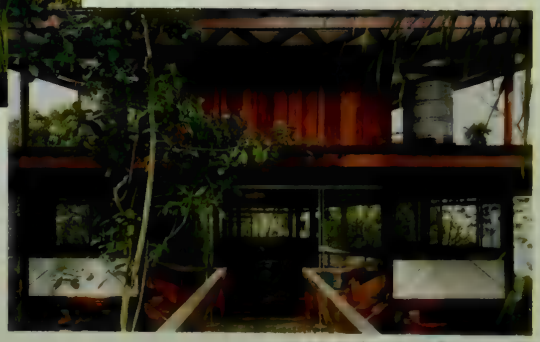


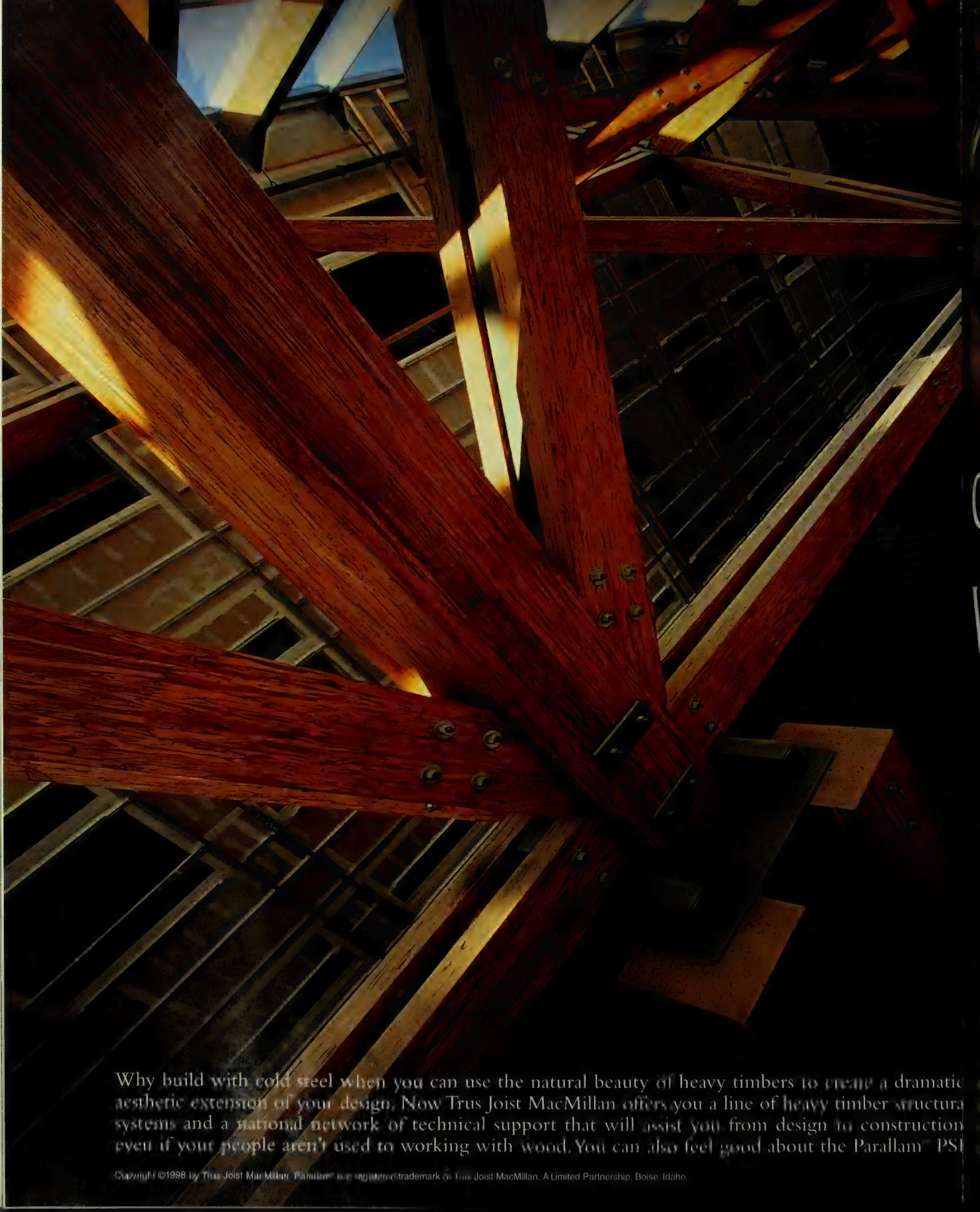




Acayaba House
São Paulo
Architects: *Marcos Acayaba Arquitetos—Marcos Acayaba, Mauro Halluli, Fabio Valentim, Suely Mizobe*

To preserve as much of the steeply sloped site and existing vegetation as possible, the architect designed this house to rest on three concrete pillars. The roof and floors are made of triangular, precast-concrete components and the walls are made of prefabricated plywood panels. Supporting elements include wooden pillars and beams and steel cables and connections. This system allowed four workers to build the 2,800-square-foot house in just four months.





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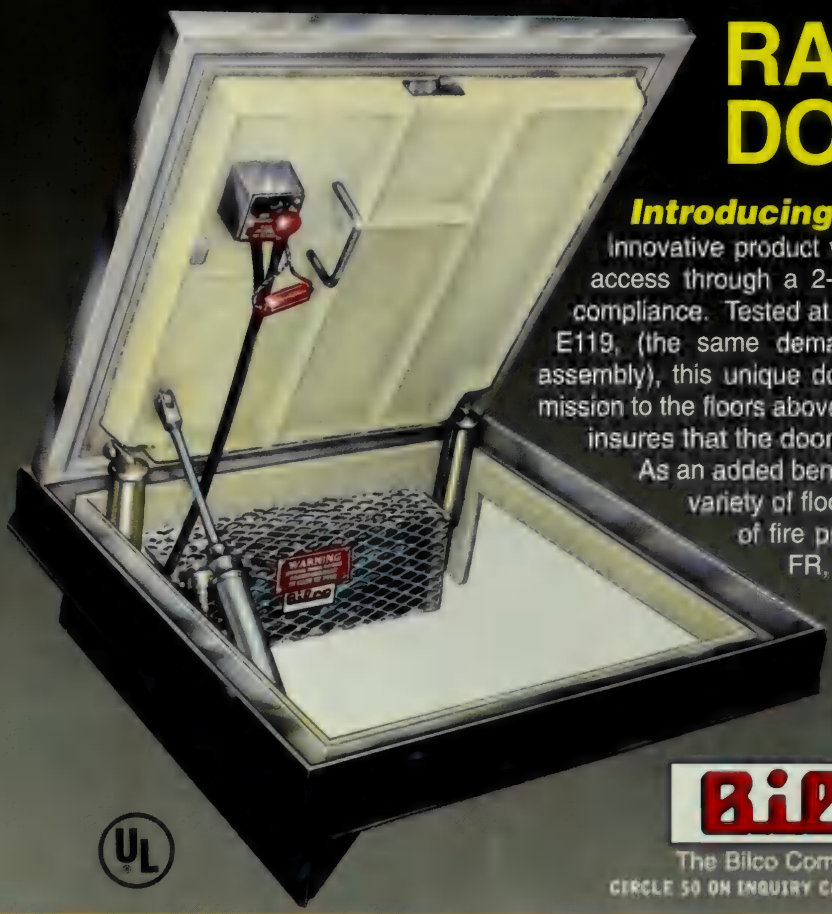
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CIRCLE 52 ON INQUIRY CARD

Record Interiors 1998

Henry Smith-Miller calls the first phase of the renovation he and partner Laurie Hawkinson just completed for the Corning Glass Center in upstate New York a "suture." While phase one includes a 9,800-square-foot structure called the West Bridge and a renovated auditorium (page 124), the majority of their ongoing work for Corning involves creating a new identity for a pair of buildings designed by Wallace Harrison in the 1950s and a 1972 Gunnar Birkerts museum. In addition, their work provides a new-generation design presence for a remote corporate campus increasingly known for its distinctive architecture. Though the centerpiece of Smith-Miller + Hawkinson's West Bridge is an interior space, the three-phase commission touches on nearly all aspects of architectural practice: master planning, building design, interiors.

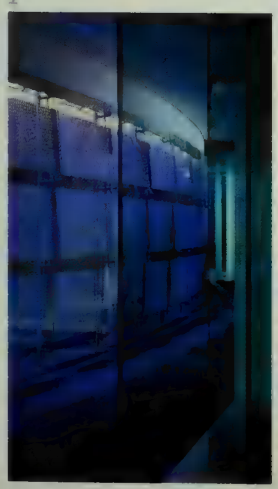
The firms featured in this issue are:
1. Krueck & Sexton Architects
2. Tsao & McKown Architects
3. Elliott + Associates
4. Smith-Miller + Hawkinson Architects
5. Herbert, Lewis, Kruse, Blunck Architecture

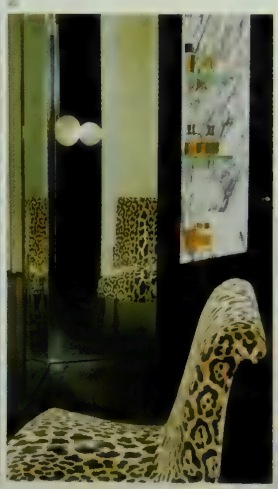
For architects Calvin Tsao and Zack McKown, who have offices in New York City and Singapore, interiors are only one aspect of a multidimensional, bicontinental practice. A recent series of residential projects gives a glimpse of their design signature, a unique hybrid of multiple styles and viewpoints (page 114).

An aura of newness pervades the work of Ron Krueck and Mark Sexton, the Chicago-based architects who completed the renovation of the Herman Miller showroom in the Merchandise Mart on a tight deadline (page 108). Once the client determined that no other furniture manufacturer in the Mart had ever done what the architects proposed, their scheme of jagged glass walls was quickly approved and built.

At M. C. Ginsberg (page 132), a West Des Moines art and jewelry store designed by Herbert, Lewis, Kruse, Blunck Architecture, curiosity is the operative word. A curved translucent wall divides the space and guarantees that shoppers don't immediately see the entire array of carefully displayed merchandise when they enter the shop.

A different concept in retailing guided the design of the CD Warehouse store in Norman, Oklahoma (page 120), a prototype for 40 franchises set to open this year. Architect Rand Elliott and his firm Elliott + Associates were inspired by brainstorming sessions with the client, which led to a design whose overall theme was the visualization of music.—Karen D. Stein

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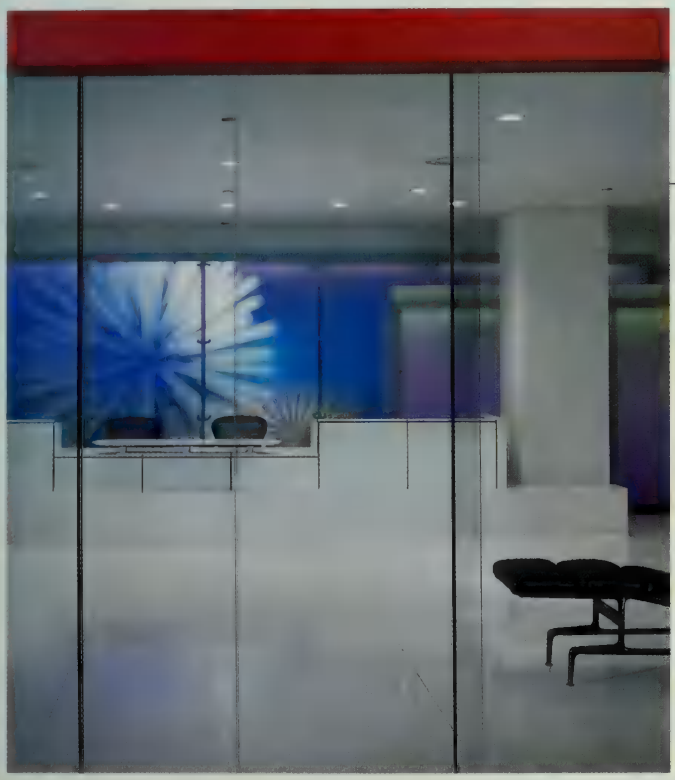
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Krueck & Sexton's daring, glass-fronted showroom for HERMAN MILLER projects a vibrant new image for the company.



A jagged wall of glass panels acts as the frontispiece of the showroom. The panels are ½ inch thick, 9½ feet high, and as wide as 6 feet.

by Karen D. Stein

Pressure can be an unexpected blessing, at least according to architects Ron Krueck and Mark Sexton. Asked last January by furniture manufacturer Herman Miller to redesign its showroom in Chicago's Merchandise Mart, they faced a looming and unyielding deadline—NeoCon, the three-day trade fair held every June. The duo had a mere 20 weeks to get the new showroom ready. But the quick decision-making necessitated by the time constraints, say the architects, ultimately paid off with their often cautious client. As Sexton explains, "It's the most rapid process we've ever been involved in. For Herman Miller it was like lightning. There was no time to play around."

The time pressure would have been hard enough, but Krueck & Sexton Architects, who had completed a more modest renovation of the showroom five years earlier, were given the added challenge of reestablishing Herman Miller's leadership position in the design community. "We used to lead with architecture. In recent years, we had slipped," says Phil Strengholt, who was the furniture manufacturer's North American vice president of sales programs during the project. "With the new showroom we wanted to bring back attention to detail: the fun, not just the functional."

What's more, because Herman Miller was uncertain which of its new products would be ready for introduction at NeoCon '98, the company's main chance at making news was with the space itself. "The showroom had to look great with nothing in it," explains Sexton. For the architects, inspiration came, in part, from Herman Miller's own history, including its long association with designers Charles and Ray Eames. "The idea of taking common materials and putting them on a pedestal goes back to the Eameses," notes Sexton.

In the world of trade shows, first impressions are important, so the architects focused their attention on the showroom's public face along the long, internal corridors of the Mart. Since NeoCon '97, Herman Miller had leased two more 20-foot-wide structural bays from a neighboring competitor, an additional 6,000 square feet that brought the showroom's total to 25,000 square feet.

In an early meeting with their client, the architects, known for their daring use of glass and metal [RECORD, April 1997, page 98], proposed a variety of possible design solutions that ranged from the straightforward to the more complex, including an almost giddy rendition of the facade as a jagged series of planes that seemed to crackle along the corridor. Prepared for the client's timidity, the architects were pleasantly surprised.

As Krueck recalls, "Strengholt said to the group working on the project, 'Has anyone ever seen anything like this before?' When it was clear no one had, he said, 'Let's do it.'" Strengholt elaborates: "I was immediately taken by the scheme aesthetically. Then I worried, 'Is it going to look like a fun house? Are the products going to undulate before our

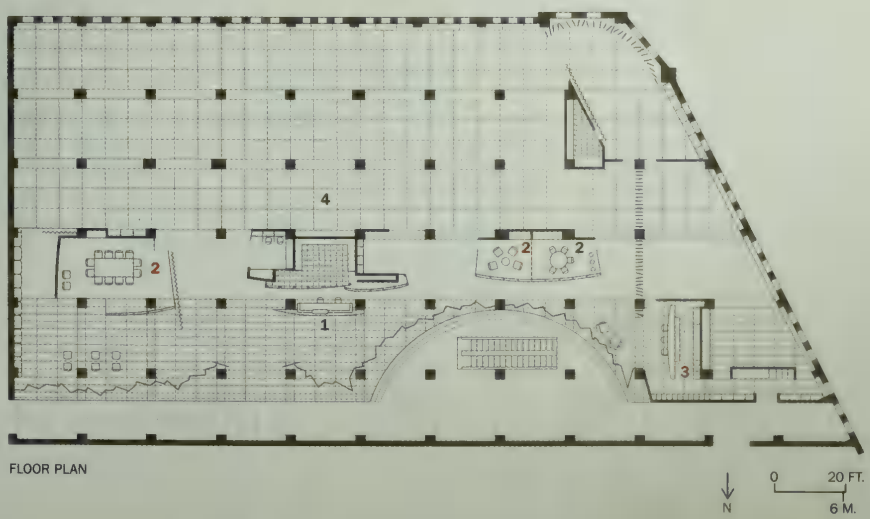
Project: *Herman Miller Showroom, Chicago, Illinois*
Architect: *Krueck & Sexton Architects—Ronald A. Krueck, FAIA, design principal; Mark P. Sexton, AIA, project principal; Thomas Jacobs, Robin A. Johnson, Paul Kozlowski, Tim Tracey, project team*
Engineers: *McGuire Engineers*
Consultants: *The Environments Group—Joe Connell, Rod Vickroy, Julie Doyle (exhibit layout); THIRST and Joyce Mast (exhibit and graphic design); Schuler & Shook, Inc. (lighting)*
General Contractor: *Clune Construction Co.—Jariath Igoe*



The front zone of the showroom (opposite and right) was intended to convey Herman Miller's credo of openness and flexibility. Circles sandblasted on both sides of the partitions' glass panels are meant to provide some privacy without completely sacrificing translucency.



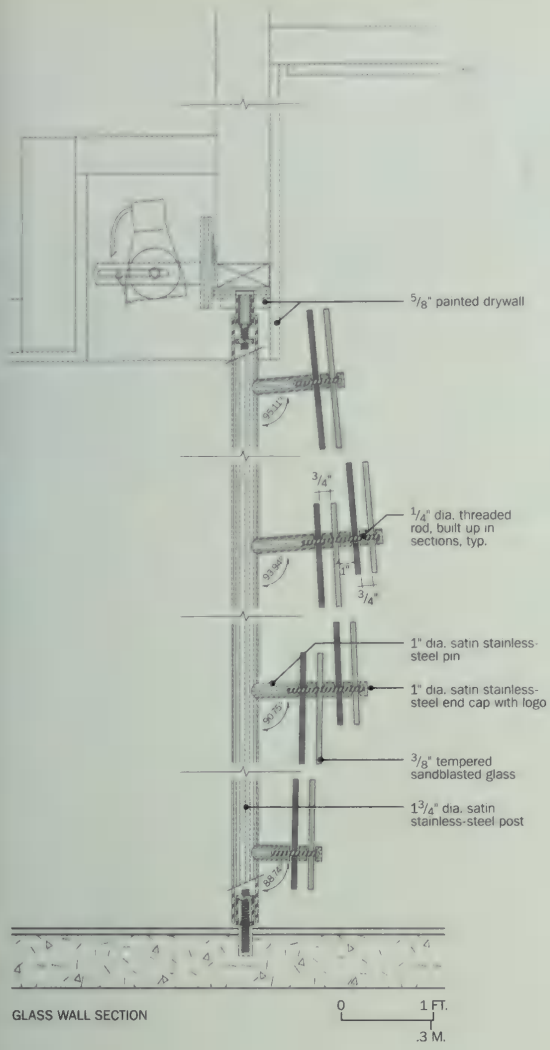
1. *Reception*
2. *Conference*
3. *Kitchen*
4. *Office systems display*



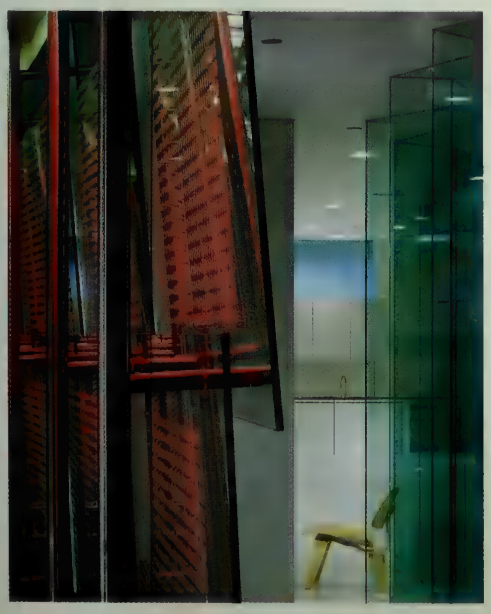
FLOOR PLAN

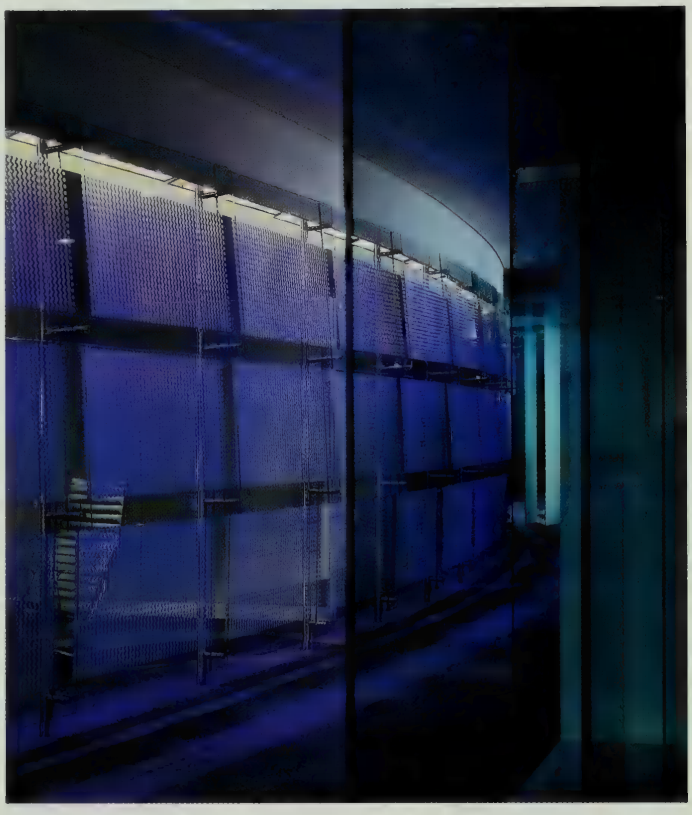


Classic Herman Miller designs are etched into glass walls (above). Logos were water-jetted on the stainless-steel caps of the curved partitions. A computer-controlled lighting system is used to adjust the mood.



GLASS WALL SECTION





eyes?'" The architects produced a large-scale mockup to reassure all concerned that the glass would create no such optical effect.

Producing the complicated glass-wall front and a series of glass-enclosed conference/product display rooms cost about twice the original renovation budget of $600,000, an increase the client accepted as in keeping with the project's expanded ambitions. In order to ensure accuracy during construction, Krueck and Sexton produced full-size paper templates for the 192-foot-long, 9½-foot-high glass wall. Once they were cut, the large panels of ½-inch-thick glass, some as wide as five feet, were fit into aluminum channels within the poured terrazzo floors.

If the main purpose of the glass front is to project a public image for Herman Miller, the remainder of the showroom has other functions to fulfill, predominantly to serve as the company's "laboratory," as Krueck describes it. This back-of-the-house area was established in the architects' 1993 scheme as a flexible space for changing seating and office furniture systems configurations.

And did this high-risk experiment succeed? "The response from the design community and our own employees was tremendous," says external communications director Mark Schurman, describing the June opening. The now-retired Strengholt, a presence at all 30 NeoCon shows to date, offers the longer view: "In all those years of walking up and down the Mart, *I've* never seen anything like it." ■

Sources

Tempered glass: *Trainor Glass*
Tempered-glass entrances: *Blumcraft*
Locksets: *Schlage*
Center-hung pivots: *Rixson-Firemark*
Acoustical ceilings: *US Gypsum*
Paint: *Benjamin Moore*
Glass terrazzo flooring: *Metropolitan Terrazzo*
Carpet tile: *Interface*
Interior colored glass: *Times Square*
Recessed downlights: *Lightolier*
Dimming controls: *Lutron*
Stainless-steel posts: *Tesko*



PROFILE The interiors of TSAO & McKOWN show a wide range of references and equal enthusiasm for style and anti-style.



Tsao (left) and McKown; their apartment (opposite); and their designs for Swid Powell (right).

by Karen D. Stein



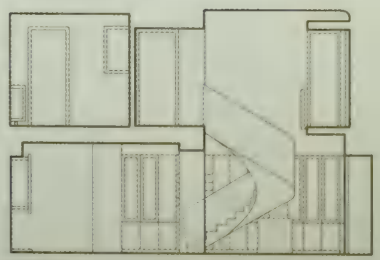
Architects Calvin Tsao and Zack McKown defy classification. In practice together for 14 years, they are known for the diversity of their work and an overall stylishness that has more to do with an attitude of assemblage than a single aesthetic. Tsao & McKown Architects design everything from the extra-large—the firm's Suntec City in Singapore includes a one million-square-foot convention center, four 45-story office towers, and an 18-story retail and entertainment complex [RECORD, May 1996, page 86]—to the tiny—their ongoing collection of tabletop objects for Swid Powell. Residential interiors have been a mainstay of Tsao and McKown, and a recent series of such projects reveals their multiple viewpoints, from the whimsical to the surreal, the literary to the arcane.

"You can find your voice without limiting your range," explains Tsao, whose frequent allusions to the dramatic arts betray his early training as a director. Discussing the firm's constant shift in scale and building type, he jokes, "It's like being in a repertory company. One day I play the ingenue. The next day I play the grandmother. If I have the skills to do both, why not?"

Why not indeed. While most young architects consider interiors a point of departure, a portfolio-builder for bigger commissions, Tsao and McKown imbue the relatively limited scope of interior work with the many disciplines—set design, couture, performance art—they have pursued at one time or another. They both give the impression that they could have chosen any number of professions and that ultimately they chose architecture not because they prefer that medium over others but because they appreciate the range of involvement it offers.

For all of their high-profile, style-conscious clients and their fluency in pedigreed domestic accoutrements—from Jacques-Emile Ruhlmann and Gilbert Rohde to Louis XV and Karl Friedrich Schinkel—Tsao and McKown apotheosize anti-style as much as style. "We don't believe in 'style,'" says Tsao. "We try to address style as a phenomenon and use it as a tool to create an environment where life can be lived.

Taut planes and sensuous curves are the backdrop for Tsao and McKown's play of cultural and aesthetic references. In the architects' own Manhattan apartment (drawing below, photos opposite and on page 116), a series of subtly differentiated surfaces—lacquered and matte shades of white, a silver-leaf wall—suggest distinct zones within overlapping spaces. The spare envelope of their Singapore apartment is offset by curvaceous, jewel-tone furnishings (page 117). In another residence, a New York duplex (page 118), the architecture plays a supporting role to a collection of bold objects.



SECTION

Still searching for a label, the observer wonders aloud, "Is there a minimal streak running through it all?" Says McKown, "It's not minimal. It's what's essential." ■



CENTRAL PARK WEST APARTMENT, NEW YORK

In their own 3,500-square-foot New York City apartment, Tsao and McKown use subtly differentiated wall surfaces—stainless steel (in the kitchen), silver leaf, multiple shades of white paint—as a foil for furniture culled from many locations and historical periods. Stairs of Brazilian cherry are the centerpiece.







SINGAPORE APARTMENT, 1994

This 3,000-square-foot duplex, where McKown lived while he supervised Suntec City, has a central stair that is a precursor of the grand staircase of the Central Park West apartment. Teak, used for the floors, continues up the walls, reframing windows and hiding pipes.









UPPER WEST SIDE APARTMENT, NEW YORK, 1996

In this renovation of a 3,400-square-foot duplex, ebonized mahogany floors act as a datum for furniture and objects. Wool rugs designed by Tsao and McKown were manufactured in Tibet. Furniture designed by the architects, including the living room's wall-hung secretary (below left) and the sitting room's orange-silk-covered sofa, coffee table, and Fortuny-clad chaise (bottom), commingle with antiques like a neoclassical chaise and mirror from Paris (below right). In the master suite (opposite), a boudoir chair in a leopard-print silk adds drama.











Oklahoma architect Rand Elliott created a distinctive prototype design for the interior of CD Warehouse, a store that buys, sells, and trades compact discs. The CD display units (below), designed by Elliott, house more than 21,000 new and used CDs.

In the prototype CD WAREHOUSE store, Rand Elliott creates an energetic, user-friendly, "musical" space.



by Elana Frankel

Tucked away in one of the more upscale strip malls of Norman, Oklahoma, between Good Vibrations Gifts for the Spirits and Wild Birds Unlimited; miles from the city's well-manicured neoclassical college campus; far from the urban sprawl of fast-food joints, truck stops, gas stations, and roadside motels, stands the first of 40 new CD Warehouse stores that will open across the country this year. The light, airy, 2,880-square-foot space, a prototype for the young franchise's future locations, is as hip as any mainstream urban retail outlet but also boasts a rough-and-tumble attitude borrowed from the surrounding plains.

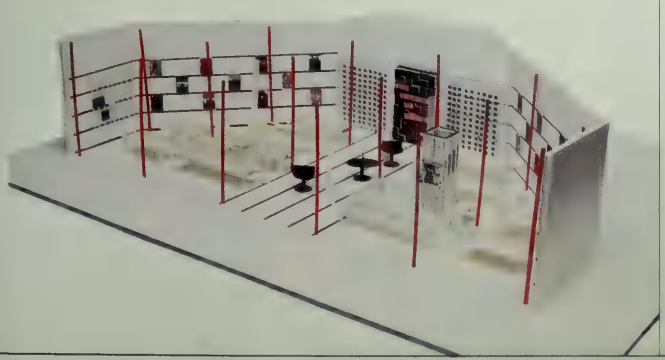
The ideas behind the CD Warehouse design began with a simple brainstorming session in August 1997. Architect Rand Elliott, an Oklahoma native and a music enthusiast, posed some broad questions to CD Warehouse's CEO, Jerry Grizzle, and his team to help define industry trends as well as the store's image and its functional needs: "What is your favorite music?" "Where is the music industry going?" "What are the spatial needs of the typical store?" He also had the team fill in blanks to complete such sentences as "Music is _____" and "Our new stores will feel like _____." The participants, whose tastes ranged from big band to rock and roll, enthusiastically contributed to the creative process.

Their answers to Elliott's questions proved to be the architect's starting point. According to one participant, the next wave in the industry is "music plus visual." Music, said another respondent, is "color, energy, light, and mood"; the stores will sell not CDs but "emotional pleasure." CD Warehouse should be "a place to hang out," explained a staff member, "a local music store that feels like my den or my favorite sweat shirt, a place where customers are not intimidated."

Elliott began to sketch out details that would transform these ideas into architecture. Combining his Modernist academic upbringing with a more personal stream-of-consciousness process, Elliott's sketches became "word paintings," a way, he explains, to describe to the client the concepts inspired by the brainstorming meeting. "I began to understand my intentions in words before forms," he further explains. The overall theme for the space that emerged from these early thoughts was the visualization of music.

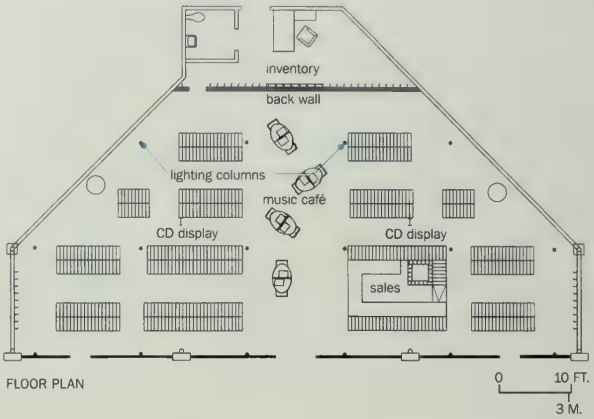
As the initial concepts began to form, Elliott built a small working model out of foamcore, "an easy, fast, and wonderful way to transform my ideas into three dimensions," he says. Elliott prefers to build a model before creating a scale floor plan. "You can get caught up in the plan," he explains. "It doesn't allow you to think beyond 'I have to build what's on the plan.'" Grizzle immediately approved the design scheme and provided Elliott with a budget.

To realize his idea of how music might be visualized in a retail environment and in a cost-efficient manner, Elliott had to be resourceful in his choices. Along the back wall, which defines the space, he designed



Project: *CD Warehouse, Norman, Oklahoma*
Client: *CD Warehouse—Jerry Grizzle, president and CEO*
Architect and Interior Designer: *Elliott + Associates—Rand Elliott, FAIA, principal-in-charge; Mike Mays, Associate AIA, project manager*
General Contractor: *K. J. McNitt Construction*





The fluorescent column lights (left), which are spaced throughout the store, resemble the stems of musical notes. The tables in the music café (opposite) read as notes against the black lines of the floor. The horizontal bands on the back wall look like a staff.

simple horizontal bands made of 1⅝-inch galvanized hat channels to resemble a musical staff. Washed with ambient light, the wall is used primarily to highlight promotional posters and new CD releases.

A series of fluorescent columns that are meant to enliven the space and serve as the store's dominant lighting—there are very few ceiling fixtures—make reference to the stems of musical notes. Reminiscent of artist Dan Flavin's fluorescent light works, the columns glow red (CD Warehouse's corporate color) on the storefront side and a variety of colors on the other side. The tables in the music café, a listening area, are shaped like musical notes.

Surround-sound speakers above the entry allow customers to hear the music and feel its vibration. A final, humorous touch appears in

THE OVERALL THEME FOR THE SPACE THAT EMERGED FROM EARLY THOUGHTS WAS THE VISUALIZATION OF MUSIC.

a neon sign above the door, which customers see only as they exit the store. It reads: "Play It Loud."

Elliott made clever use of materials to keep within the client's tight budget, creating a simple and economical sign and display system, for instance, by using industrial-style bulldog clips with plexiglass and fiberglass panels and standard steel-slotted angles. Basic resilient floor tiles, scored with black lines in the music café to create another musical staff, provide a hard surface that bounces sound around the store.

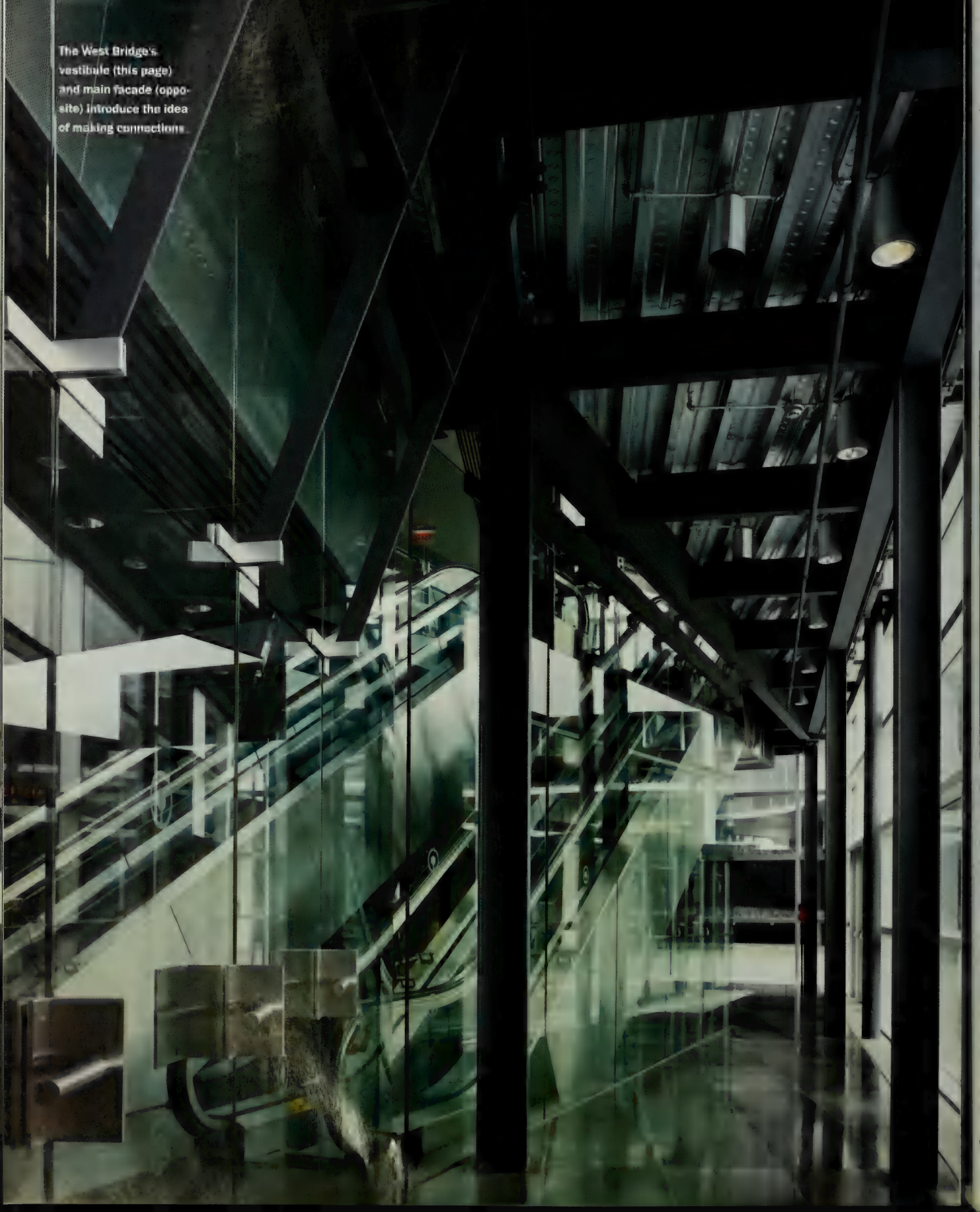
One of Elliott's more pressing challenges was to find a way to effectively accommodate 21,000 new and used CDs into the store and to present them without the annoying glare that is often caused by light reflecting off the CDs' plastic covers. The architect's solution was to design a series of CD display tables with task lighting located above and below so that the tables appear to float above the floor and reflections are minimized. The displays can also accommodate digital video disc (DVD) screens for franchises that may want to incorporate such technology at a later time.

For the store's grand opening in March of this year, Elliott and his team draped the front of the building in a Christo-like fashion. After the unveiling ceremony, attended by the CD Warehouse team, a group of potential franchisees, local colleagues, and friends, the new retail space was alternately described as industrial, electric, economical, ethereal, and, most important, musical. The range of descriptions captures the store's user-friendly nature and its ability to evoke the energy of music for everyone, no matter what their taste—and all for a total construction cost, including furniture and signage, of approximately $134,500. ■

Sources

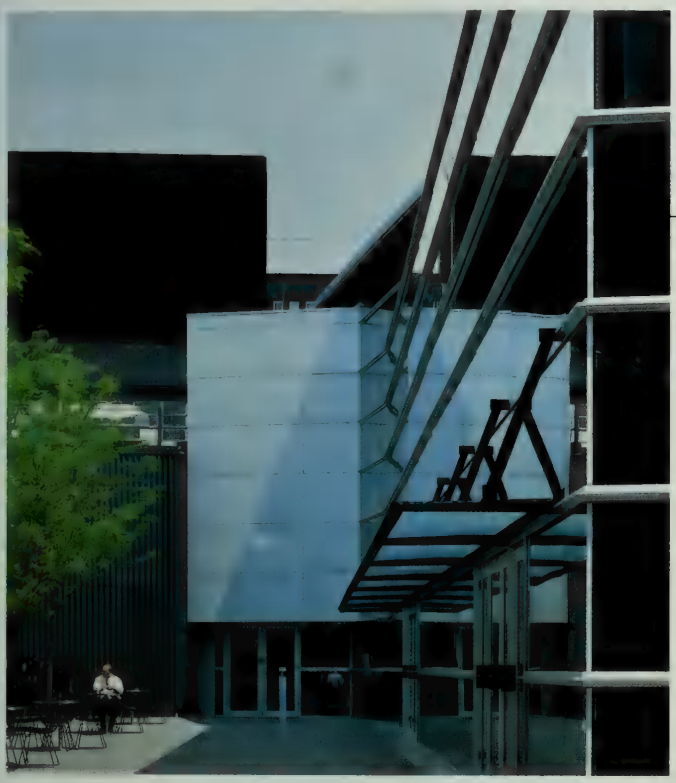
Carpet: *Atlas*
Resilient flooring: *Armstrong*
Rubber base flooring: *Roppe*
Paint: *Sherwin-Williams*
Doors and hardware: *Hager, Yale, Hewi, Ives, GL*
Light columns, wall washers, strip fluorescent lights, display-table lights: *Metalux*
Downlights: *Halo*
Surface-mounted HID lights: *Lumark*
Gooseneck café-table lights: *Brookstone*
Exit lamp, emergency light: *Surelite*
Interior signage: *Elliott + Associates (design), ASI (fabrication)*
Exterior signage: *Metro Sign Company*
Café seating: *Nuovo Melodrom (Jacobsen chair)*
Display tables: *Danmark*
Table bases: *Falcon*
Custom furniture: *Danmark, Mark Burrows, Falcon*
Sales counter: *Danmark*
Fiberglass panels: *Sequentia*


JIMI HENDRIX
EXPERIENCE
NEW RELEASES
THE FUTURE OF MUSIC
NEW RELEASE
CD WAREHOUSE



The West Bridge's vestibule (this page) and main facade (opposite) introduce the idea of making connections.

Smith-Miller + Hawkinson's addition to the CORNING GLASS CENTER connects to the past while pointing to future growth.



by Clifford Pearson

It's a glass suture," says Henry Smith-Miller, talking about the recently completed first phase of his firm's renovation and expansion of the Corning Glass Center in upstate New York. "It stitches together several different buildings and acts as a new spine that opens up views," adds Laurie Hawkinson. Called the West Bridge, the 9,800-square-foot structure heals a wound caused by piecemeal growth among the public buildings at Corning's corporate campus.

Opened in 1951, the Glass Center started as a pair of buildings designed by Wallace Harrison of Harrison & Abramowitz: an elegant glass box serving as a visitors' center and a Modernist shed housing a factory for Steuben glass. In 1972 Gunnar Birkerts designed an amoeba-shaped museum that attached itself to one corner of Harrison's strictly orthogonal visitors' building. In the process of adding to the complex, Birkerts moved the main entrance from the east facade of the Harrison building to his new museum on the southwest part of the site.

Other changes over the years resulted in convoluted circulation through the Glass Center, making it difficult for some visitors to orient themselves. By the early 1990s the complex had gotten a bit tired, a fact reflected in attendance figures that dropped from a peak of 500,000 visitors a year in the early 1980s to under 300,000 a decade later. "We realized we needed to freshen up the place," notes Kenneth Jobe, director of corporate projects for Corning.

Since noticing the crowds that its glass exhibit attracted at the 1939 World's Fair in New York City, Corning has understood the value of architecture in shaping its public image. In addition to buildings by Harrison and Birkerts, the company's corporate campus includes a new headquarters building by Kevin Roche and a day-care center by Scogin, Elam, and Bray. "The Glass Center is seen by the company as a cultural center for the community," explains Jobe. "This is particularly important if you're a Fortune 500 company and you want to attract talented people to work for you in a small upstate town."

Representing a new generation of architects, Smith-Miller + Hawkinson first worked with Corning on a temporary exhibit in Harrison's visitors' center [RECORD, September 1994, page 62]. The exhibit showed the company that Smith-Miller + Hawkinson could inject new vitality into the old building and led Corning to hire the firm for a much bigger job: the 31,000-square-foot, $60 million renovation and expansion of the Glass Center, which the company calls the Glass Center 2000 project.

The new West Bridge and the renovation of an existing auditorium are the first fruits of the project. Phase two, scheduled to open in May 1999, is the 11,000-square-foot Innovation Center, which erupts from within the visitors' center and will feature exhibitions by Ralph Appelbaum Associates. The third phase, already under construction and set to debut in 2000, is the 10,000-square-foot Orientation Center, which will act as a new front for the Glass Center and return the main entrance to the east side of the complex.

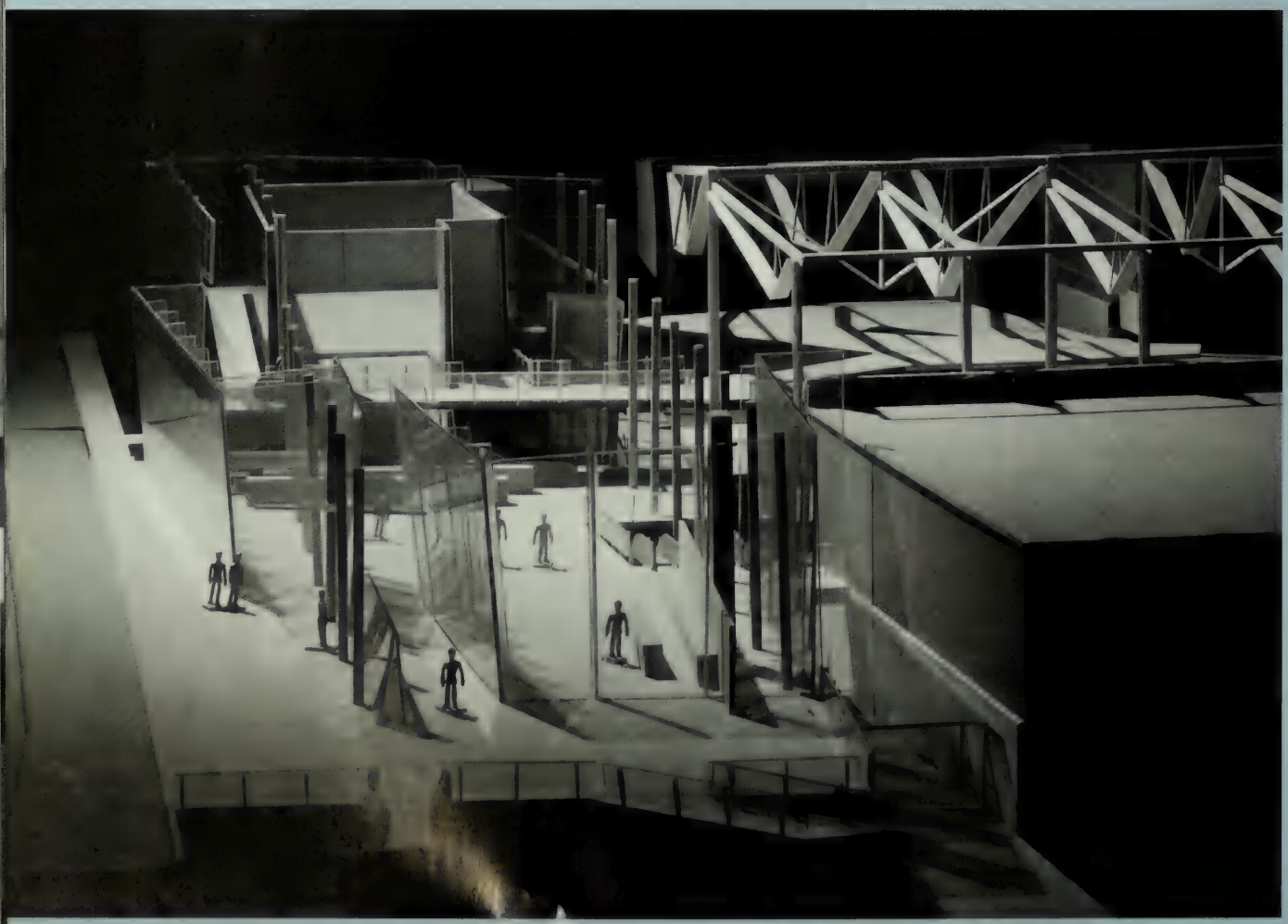
Project: *Corning Glass Center 2000, Corning, New York*
Architect: *Smith-Miller + Hawkinson Architects—Henry Smith-Miller, AIA, Laurie Hawkinson, design principals; Ingalill Wahlroos, project architect; John Conaty, Ferda Kolatan, Flavio Stigliano, Oliver Lang, Mauricio Salazar, Catherine Bird, Paul Davis, Maria Ibanez de Sendadiano, Christian Lynch, Akira Okaji, Eric Van Der Sluys, Kristina Yu, Karin Taylor, project team*
Engineer: *Ove Arup & Partners (structural, mechanical, electrical, plumbing)*
Consultants: *Quennell Rothschild (landscape); Claude Engle (lighting); R. A. Heintges Architects (curtain wall); Fisher Dachs (theater)*
General Contractor: *Welliver McGuire*

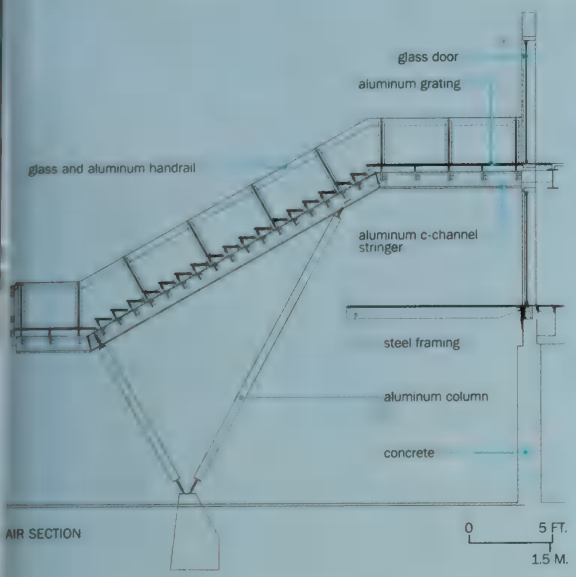
WWW On The Web: *Take a virtual tour of this project at www.archrecord.com.*

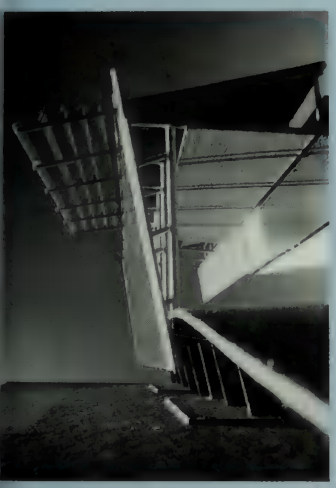
FUTURE PHASES EXPLORE POSSIBILITIES OF GLASS IN ARCHITECTURE

Now under construction, the second and third phases of the $60 million Corning Glass Center 2000 project (model below) will transform much of the existing complex and add a new front. New exhibits, designed by Ralph Appelbaum Associates and organized into galleries titled "windows," "vessels," and "opticals," will occupy the Innovation Center, which will debut in May 1999. To fit the 11,000-square-foot Innovation Center into the original 1951 Glass Center, Smith-Miller + Hawkinson raised the roof and designed a jazzy procession from the West Bridge to the yet-to-be-completed Orientation Center on the east end of the complex. For the last phase of the project, the architects designed an angled facade made of large frameless glass plates that will be supported by stainless-steel tension and compression members (photos opposite). One wall will have masts on the exterior, while another will be supported on the inside, creating both an "exoskeleton" and an "endoskeleton." A dramatic stair (right) will lead to the Orientation Theater, located on the second floor. Visitors will arrive at the second level in jitneys running on a raised roadway.



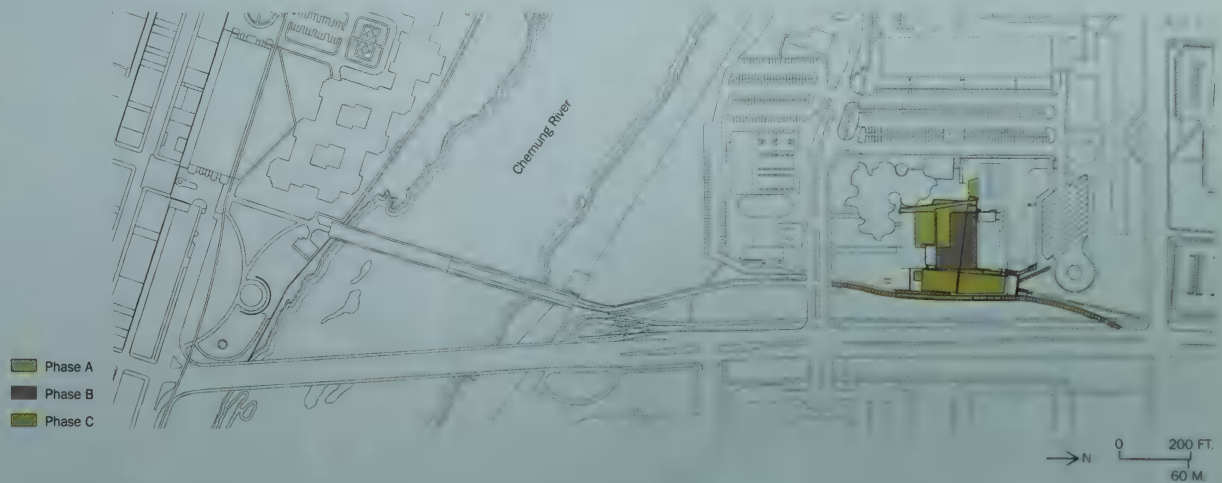






The new entry facade will be angled at 7.5 degrees and be made of glass plates and elements connected by point fittings drilled through the glass. Layers of transparency will blur the separation of indoors from out.





Three eras meet at the south end of the West Bridge (below). The layering continues inside, where spaces run vertically as well as horizontally (right).





"This project is about presenting a new skin and then playing with the spaces in between the new and the old," explains Hawkinson. Her comment was made in reference to a mast-steadied, two-story glass facade that will be one of the showpieces of the project's last phase, but it is equally applicable to the already completed West Bridge. Indeed, the first and last phases of the project share many of the same design challenges: creating new frontispieces for the two primary facades of the complex, exploring the varying character of glass, linking old and new, and incorporating pieces of Harrison's glass-block exterior wall inside new spaces. The solutions devised for these two phases are quite different, but the ideas at play are the same. As Herbert Muschamp wrote in the *New York Times,* the two additions on either side of Harrison's visitors' center act as "a pair of faceted quartz bookends."

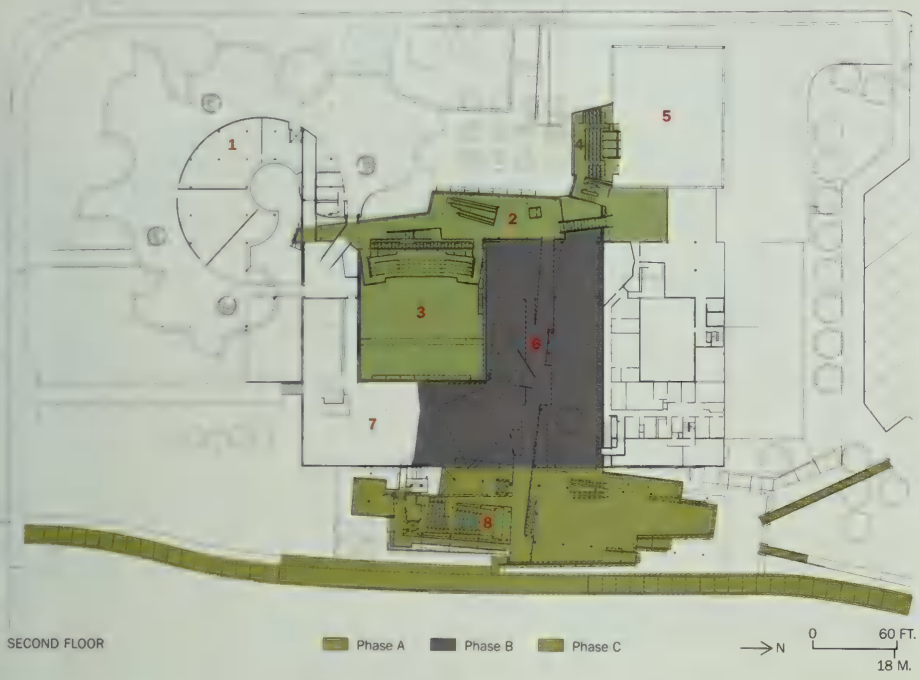
CORNING HAS A MATERIALS CULTURE, AND THE ARCHITECTS HIRED BY THE COMPANY USUALLY SHARE THIS PASSION.

Showing off glass is an obvious strategy that has been employed by every architect who has worked at Corning. So it's not surprising that the company would be interested in Smith-Miller + Hawkinson, whose work has often investigated the nature of materials. "There is a materials culture at Corning and I knew that Henry and Laurie's approach would reverberate with the people in the company," explains Samuel Frank, who was the director of architecture and design at Corning when Smith-Miller and Hawkinson were hired. "Their work is honest and exploratory and engaged with an understanding of materials," adds Frank.

While Harrison experimented with various kinds of opaque and translucent glass on his Corning buildings and Birkerts used glass in an expressionistic way reminiscent of the German architect Bruno Taut, Smith-Miller and Hawkinson were fascinated by the three-dimensional aspects of the material. "Usually you see glass frontally, but we wanted to present glass on edge," explains Hawkinson. As a result, visitors see the new glass elements as planes, rather than as transparent surfaces. To heighten the effect, the architects established a slightly skewed geometry that pushes the additions at an angle from the original building and cants glass walls at a 7.5-degree angle. The angled elements also serve the more prosaic function of pointing visitors in the direction of escalators and circulation spines.

While the architectural effect of the glass elements in phase one is innovative, the materials used are not cutting edge. Indeed, the new west facade employs a standard curtain-wall system with low-e glass and aluminum mullions. A renovated courtyard with a new arbor of locust trees shading the West Bridge makes a more sophisticated (and expensive) system unnecessary.

Before the West Bridge was built, people often had a hard time finding their way from Birkerts's museum to Harrison's factory building (where glassblowing demonstrations are held). Sheathing the addition in



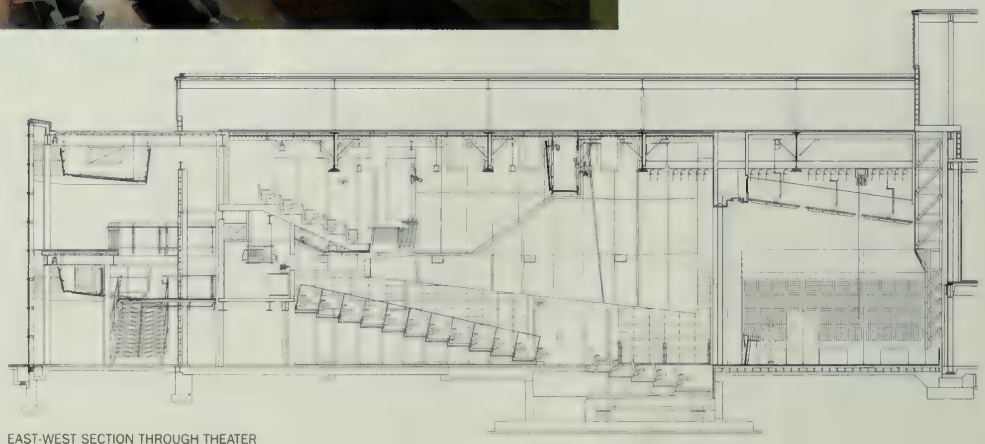
1. *Museum (1972)*
2. *West Bridge*
3. *Performing arts theater*
4. *Glassblowing demonstration*
5. *Factory (1951)*
6. *Innovation Center (1999)*
7. *Glass Center (1951)*
8. *Orientation Theater (2000)*

A glass bridge (below) takes visitors from Birkerts's building, across the West Bridge, and into renovated space in Harrison's Glass Center.





An old multipurpose auditorium has been converted into a 770-seat performing arts theater (left) with sophisticated acoustics. Seats can be removed and the stage lowered to create a single floor surface for functions such as dinners and balls.



EAST-WEST SECTION THROUGH THEATER

glass has opened up views to the other buildings, so visitors can see where they have been and where they are headed. In a similar vein, the architects "blew out the [southwest] corner" of Harrison's visitors' center, says Smith-Miller, creating striking views at a point where three different buildings come together.

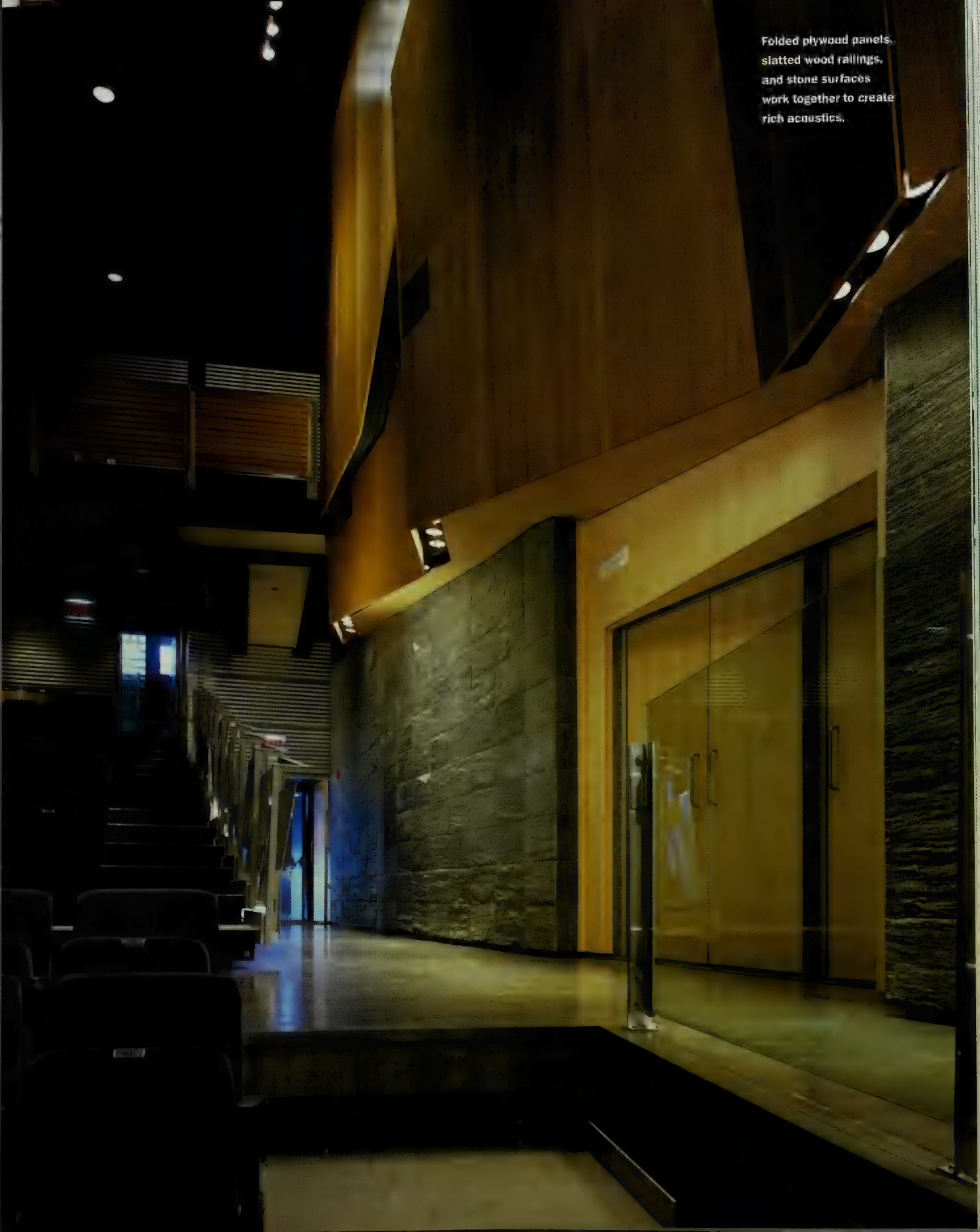
In addition to connecting places and eras, the West Bridge houses a 40-seat café on its ground floor and serves as the lobby for a remodeled 770-seat auditorium. Originally a multipurpose room, the 100-by-100-foot space has been transformed into a performing arts theater with sophisticated acoustics, removable seating in the orchestra, and a new balcony cantilevered out from the West Bridge and suspended from the roof at two points. "Folded" plywood panels and Italian stone on the side walls work together acoustically and provide a visual contrast to all the glass found in the rest of the complex.

One of the challenges of the project was reworking the old buildings' mechanical systems to accommodate higher volumes of traffic and higher standards of comfort. For example, the multipurpose room originally had no air conditioning. A series of rooftop air-handling units was installed later but proved to be unsightly and inadequate. Smith-Miller + Hawkinson dealt with the situation by installing a new HVAC system on the roof of the performing arts space and using large, low-velocity ducts to keep noise levels down, explains Ingalill Wahlroos, the project architect. For the West Bridge most ducts and mechanical systems have been inserted underneath the floor of the second level.

Stepping back from the Corning project to look at the grander scheme of things, Smith-Miller says, "During the last 10 years, architecture has been about the very large significant gesture. Now I think you're seeing the emergence of a new generation of architects who are really interested in craft and the way things come together." The Corning Glass Center 2000 certainly exhibits an attention to detail and an almost obsessive interest in making connections. But with its sleek, angled forms slipping past one another and its complex layering of spaces, this is a project that clearly makes a few gestures of its own. ■

Sources

Curtain wall: *EFCO*
Anodized aluminum panels: *Una-Clad*
EPDM roofing: *Carlyle*
Built-up roofing: *Siplast*
Low-e, insulated glazing: *Viracon*
Flooring: *Kirkstone Flooring*
Lighting: *Edison Price Lighting*
Escalators: *Schindler*
Auditorium seating: *GDS*
Ceiling system: *Simplex*
Exposed metal deck: *Epic*



Folded plywood panels, slatted wood railings, and stone surfaces work together to create rich acoustics.

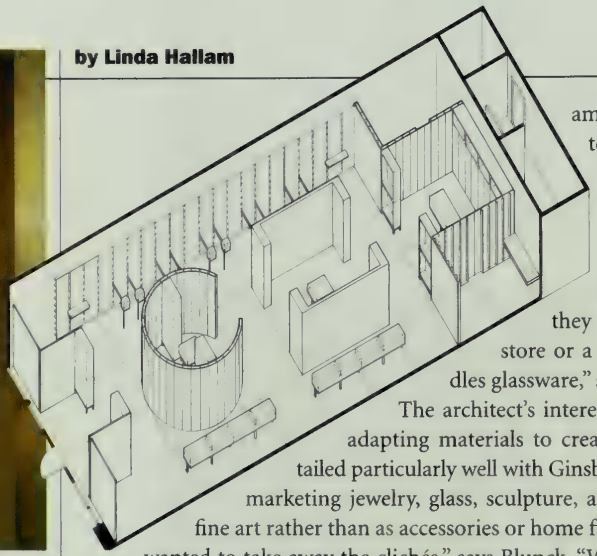


Sculpture, art, and jewelry are displayed in the neutral, gallery-like setting of M. C. Ginsberg.

Architect Kirk Blunck's design for M. C. GINSBERG decontextualizes a West Des Moines art and jewelry store.



by Linda Hallam



Inspired by sophisticated gallery displays and the current proliferation of touring art shows, the interior of M. C. Ginsberg Objects of Art, a fashionable West Des Moines, Iowa, jewelry store, treats commerce as an experience and a destination. Architect Kirk Blunck, of Herbert, Lewis, Kruse, Blunck Architecture, worked within his own interpretation of what could be called decontextualism.

Rather than replicate or even blend his design with the styles of the shops in the surrounding upscale suburban shopping strip, Blunck designed an interior that melds cloistered commerce with art. Instead of the typical plate-glass store windows that blatantly proffer merchandise, M. C. Ginsberg entices the passerby with a four-foot-wide, black-steel-clad door, which serves as the store's discreet public face. Once inside the store, the visitor experiences architecture as both artistic presentation and theater.

One way Blunck achieves this effect is by consciously controlling access. "In a typical retail store, you walk in the door and see the whole space from front to back, the whole array of merchandise," he notes. "There's nothing left to the imagination, no element of curiosity." Curiosity is the operative word: owner Mark Ginsberg, an art patron and a frequent traveler, strived to re-create the ambiguities and ambience of contemporary studio and gallery spaces. "When people enter, they don't simply assume that they are in a jewelry store or a store that handles glassware," says Blunck.

The architect's interest in art and in adapting materials to creative uses dovetailed particularly well with Ginsberg's concept of marketing jewelry, glass, sculpture, and furniture as fine art rather than as accessories or home furnishings. "We wanted to take away the clichés," says Blunck. "We didn't necessarily feel we had to use granite or polished brass. As an architect, I'm interested in materials—how they relate to one another, and how prosaic materials such as concrete look when they are finished correctly."

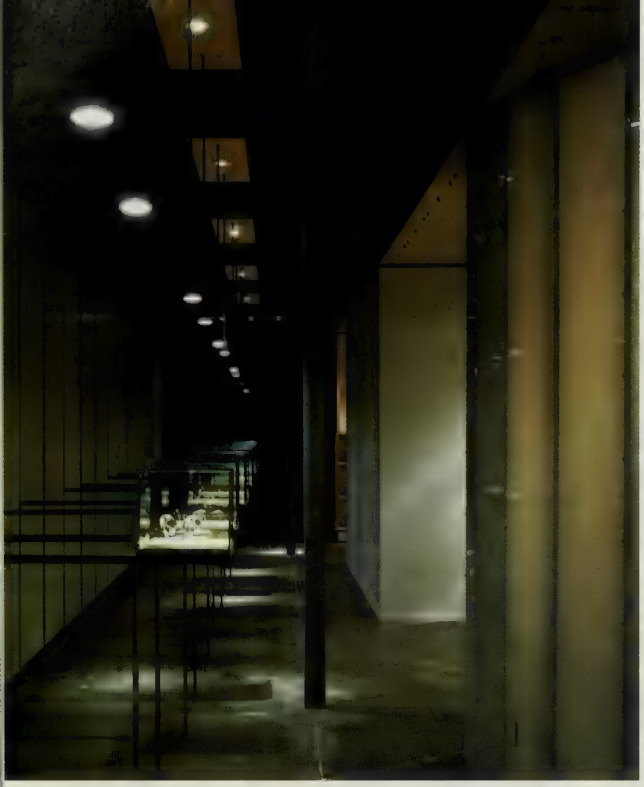
The materials the architect chose—concrete, concrete panels, extruded plastic, sandblasted steel, and maple—give a neutral quality to the space. Ash panels finished in a black translucent stain, black industrial fasteners and stainless-steel hardware, and black halogen light fixtures provide contrast without competing with the objects for sale. "There are no strong colors here," Blunck says. "There's a reason art galleries have neutral backgrounds."

As in the careful staging of a theatrical production, the interior is slowly revealed as the steel exterior door opens to a cool, carefully lit environment. A circular translucent wall divides and defines the center of the 3,000-square-foot space. The wall also prevents shoppers and browsers from taking in the space with one glance or strolling casually through the store. Rather, patrons must choose which way to go: to the

Linda Hallam is an author and editor of shelter books for Meredith Publishing in Des Moines, Iowa.

Project: *M. C. Ginsberg Objects of Art, West Des Moines, Iowa*
Owner: *Mark Ginsberg*
Architect: *Herbert, Lewis, Kruse, Blunck Architecture—Kirk Blunck, FAIA, Ellen Kyhl, AIA*
General Contractor: *Holcomb Corporation*
Millwork: *Tony Lisac Construction*
Mechanical/electrical, light fixtures: *Stroh Corporation*

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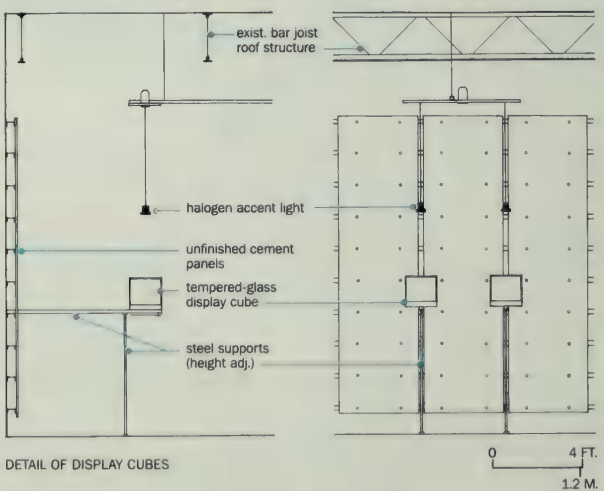
right, where sleek cases of glass and wood line the interior wall in a reinterpretation of the traditional jewelry store; or to the left, where jewelry is displayed in a more gallery-like setting of custom-made tempered-glass cubes supported by steel bars and tubes.

Steel bars mounted between unfinished industrial cement wall panels are used to create a flexible display system that can be changed at will. Steel tubes act as support rods at heights of two, four, five, and six feet. The space created by the circular wall of plastic panels is used as a backdrop for changing sculpture displays. Hooks can be attached to the wall as well as the ceiling for expanded display, and the panels can be disassembled and removed for special exhibitions.

Flexibility does not preclude order, however. The center of the curved entry wall lines up on axis with the spine of the store. The architect further imposed a sense of structure by working in an eight-foot grid, dictated by the plywood panels' standard dimensions—four by eight feet. The concrete floor is also scored in eight-foot squares, and halogen pendants suspended from tracks organized on the same grid heighten the feeling of regularity.

Taking the store's noncontextual quality to its ultimate end, the architect designed the space so that when the three-year lease expires, the elements can be disassembled, if the owner desires, and moved to a new location. "Like a stage set for the theater, the important pieces can be used again," says Blunck. ■

Custom glass: *Two Rivers Glass*
Ornamental iron: *Hawk Metal Products*
Security/safety systems: *AAA Security*
Floor covering: *Huega Tiles*
Translucent panels: *Polygal*
Solid panels: *Eternit*
Custom tabletops: *Celotex*
Bar sink: *Just Manufacturing*
Bar faucet: *Hans Grohe*
Sound system: *Bang and Olufsen*



Steel tubes and bars support custom-made, tempered-glass cubes for displaying jewelry (left top and bottom and drawing above). The height of each cube can be adjusted on the suspension system, which is mounted between panels of industrial cement board.



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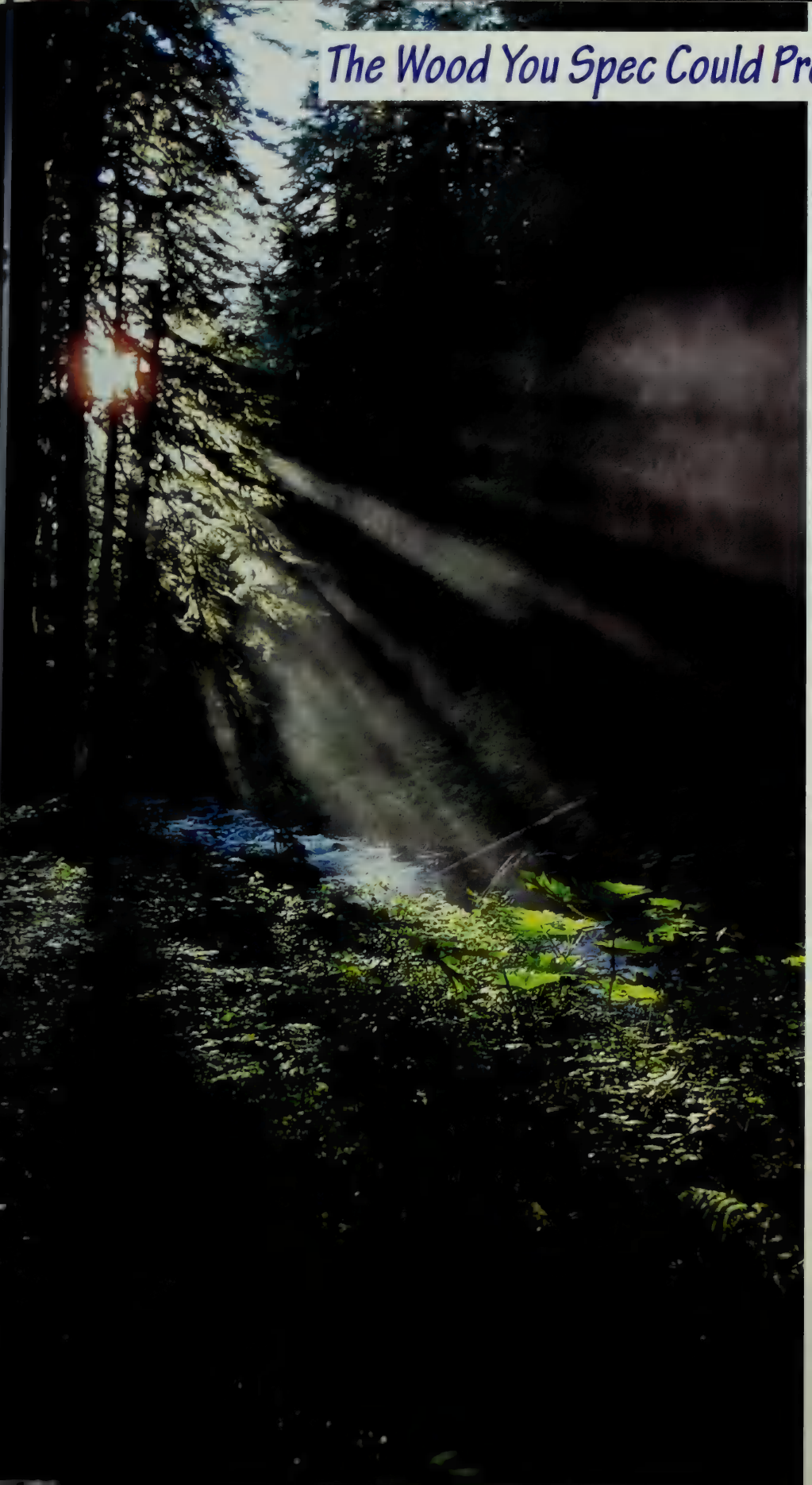
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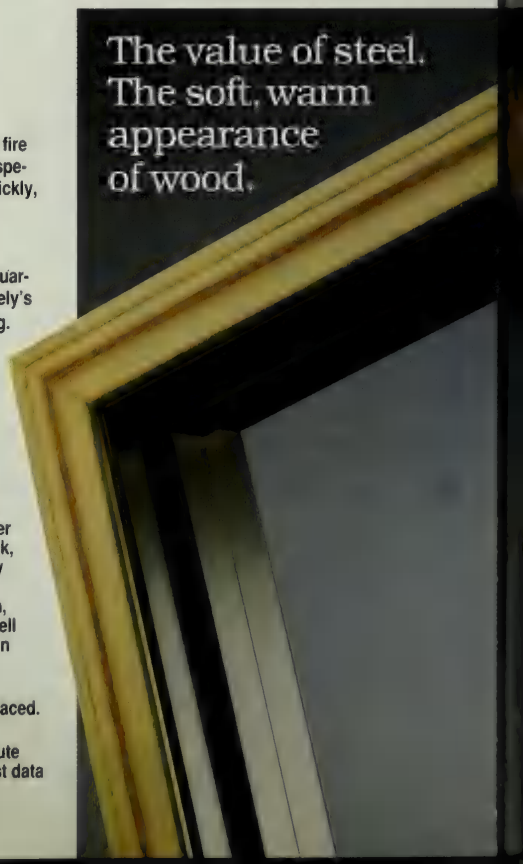
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COMPUTERS IN ARCHITECTURE...

The changes wrought over the last 20 years by such developments as the affordable personal computer, computer-aided design, photorealistic rendering software, and, more recently, the Internet and the Web have been so powerful and pervasive that the practice of architecture will never be the same. Coverage of this evolution has long been a mainstay of RECORD, *although in recent years we have been challenged, as have all magazines, to keep pace with the rapidly evolving technology.*

Since January 1997 we have enhanced our coverage of the topic by publishing articles that go beyond simple discussions of CAD to grapple with such issues as how computers can streamline practice and management and how the Internet is changing the way architects work. These stories have included, among others, "Copyright Law in the Age of the Web" (June 1997, page 169); "Collaboration by Wire" (September 1997, page 131); "The Architecture of Cyberspace" (November 1997, page 139); "Changing the Face of Practice with Digital Technology" (June 1998, page 72); and "Entering the Third Dimension," a story on 3D modeling software (June 1998, page 175).

Earlier this year we launched our Web site, www.archrecord.com, which now includes an index to articles from the last five years and virtual-reality tours of well-known architectural projects. We will continue to add new features.

SEE OUR CAD SELECTION TABLES ON THE WEB
In addition to the computer section on the following pages, ARCHITECTURAL RECORD is pleased to present comprehensive online selection tables for CAD buyers, compiled by W. Bradley Holtz, author of *The CAD Rating Guide* (ZEM Press). Visit our Web site at www.archrecord.com.

But the scope of computer technology is so large, and the needs of our readers so great, that we decided the subject deserved this special section in the magazine. In the first article, computer consultant and architect Jerry Laiserin, AIA, presents techniques for developing technology plans for architectural offices. Freelance writer B. J. Novitski presents five case studies that demonstrate ways in which architects are using computer tools to improve the exchange of information, to archive important data, to search for product information, and to provide value-added services for clients.

Steven S. Ross, who has written more than 100 software reviews for RECORD *over the last dozen years, reports on the latest developments in software seen at this year's trade shows. Ross has also compiled a buyers' guide including questions that those who plan to purchase equipment like printers, digital cameras, or modems can ask of their vendors.*

And we're not done yet. Watch for an article later this year by Kristine K. Fallon, FAIA, who writes about training the computer users within an architectural firm to use the technology to its greatest advantage. As Fallon points out in her article, "Architects are reaping great benefits from technology, but there's plenty more to learn."

—Charles Linn, AIA, and Wendy Talarico

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Jerry Laiserin, AIA

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Steven S. Ross

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B. J. Novitski

169 **Computer Buyer's Guide: What To Buy and How To Buy It**
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Planning a Computer Technology Strategy for Design Professionals

by Jerry Laiserin, AIA

As little as 10 years ago, few design firms used computers, and fewer still wove their computers into the everyday fabric of their practice. Today, a majority of firms use advanced computer and communications technologies on a daily basis, often with the necessary tools readily available on every employee's desk. Yet there is no guidebook, no single resource, that helps design firms identify, choose, and implement technology strategies to complement their market-positioning and business strategies.

Even among those well-managed firms cited for their comprehensive use of information technology, many have not addressed the few simple questions that every principal wants answered: Why does the company need a technology strategy? How do we develop one? How will we apply it to this firm?

EXPERIENCED USERS RECOGNIZE THAT HARDWARE AND SOFTWARE REPRESENT ONLY A FRACTION OF TOTAL TECHNOLOGY COSTS.



A case for technology strategy

Management guru Peter Drucker has observed that "every business has a strategy. The problem is that 90 percent don't know what it is." Seeking least-cost, industry-standard, or state-of-the-art technology may be equally valid approaches for different firms. Deciding which is best for an individual firm is the difficulty. The same goes for software; what is ideal for one firm may be underpowered for another yet inappropriately complex for a third. Technology policies that support productivity in one practice may stifle creativity in another.

Such differences in performance capabilities are compounded by order-of-magnitude differences in system cost. In other words, while useful work can be accomplished with an investment of less than $2,000 in hardware and software, equipping a full-blown design/production "seat," or station, can quickly run up to five figures. Furthermore, experienced users recognize that hardware and software represent a fraction of total technology costs. Results from the AIA's 1997 Firm Survey, which included more than 4,000 member-owned companies, show that 94 percent of all design firms are using computers. Most firms spend between 5 and 8 percent of net revenue per employee per year on the total cost of hardware, software, networking, upgrades, supplies, services, maintenance, support, and training—a total of $361 million last year. Companies with 50 or more employees each spent an average of $187,100 on hardware alone while investing $141,000 in technical support in 1997.

These numbers are proportionate to the percentage of revenue that is spent on marketing, or the percentage that flows to the bottom line as profit. Clearly, then, no design firm can afford to spend too much or too little on technology, or to risk squandering its technology investment on inappropriate or dead-end tools.

Experimenting with different strategies in search of the one that is "just right" is not a practical course. Instead, some practice management commentators have provided insight into overall firm strategies that can serve as general guidelines in determining technology plans. Weld Coxe, AIA, founder of a management consultancy specializing in design professions, and David Maister, a former Harvard Business School professor, have independently theorized that design firms are oriented toward one of three different market positions: strong-delivery/procedural work, which means the firm is best at solving routine problems by providing quick, practical solutions and economical documentation; strong-service/"gray-hair" work, which means the architects can solve broad, complex problems and offer comprehensive advice; or strong-ideas/brain work, which means the designers are good at solving unique problems through innovative thinking. No matter their size, all firms combine elements of each approach. Yet one of these three typically predominates. And that helps determine wise choices in computer technology.

For a firm that emphasizes rapid production and delivery of documents, computers may add little more than speed. To clients like

Jerry Laiserin, AIA, consults with architects who are developing and implementing technology plans. He is CAD-in-practice editor of ACADIA, *the quarterly journal of the Association for Computer-Aided Design in Architecture.*

national retail chains, this is most beneficial: their doors will open, with cash registers ringing, that much sooner.

For architectural firms that specialize in complex projects, computers permit exhaustive studies of program alternatives, allowing for better management of massive databases. They also improve project coordination for large projects, such as major medical centers or international airports. But for those firms that are sought for their innovative design, computers offer a method of exploration that would be difficult and time consuming to do by hand. The design of the swooping forms of Frank O. Gehry & Associates' Guggenheim Museum in Bilbao, Spain, for instance, was facilitated by the use of CATIA, a 3D computer modeling system (photograph below).

With these models in mind, it's also possible to set some cost parameters. Frank Stasiowski, FAIA, publisher of several practice management newsletters, points out that the first model—commodity-type procedural work—tends to garner lower fees than one-of-a-kind negotiated service on the order of Frank Gehry's designs. Extending Stasiowski's argument, lower fees require lower costs in order to maintain profitability, which in turn implies that firms focusing on procedural work probably cannot obtain and maintain as much or as up-to-date technology as firms engaged in higher-margin, strong-idea practices.

Combining these perspectives, it is easy to see that strong-delivery/procedural firms neither need nor can afford the latest and greatest in technology. Their strategy must be to minimize technology costs, even at the expense of performance. Such firms' focus on value will most likely result in their waiting to buy mature technology as its price declines, and then keeping it in service longer. They should choose generic software tools and expect employees to train and support themselves. This frugal, no-frills approach is best suited to frugal, no-frills practices.

Strong-service/gray-hair firms can charge higher fees and are thus able to afford more costly technology—the kind that allows them to deliver the performance their full-service clients expect. Such firms should buy fully loaded PC hardware and the latest releases of industry-standard software. They should count on providing training, hiring technology support personnel, and relying on staff with strong computer backgrounds.

Strong-idea/brain-work firms are often able to invest the most in technology. Capturing the unique solutions of a design principal may outweigh worries about cost. This is the realm of 3D digitizers, exotic software, and expensive workstations. Such firms are more likely to undertake the administrative overhead and cost burden of supporting multiple hardware/software platforms to achieve the ideal blend of computer tools and techniques. System support and decision-making are likely to remain in the hands of design professionals, and self-starting users tend to train and support each other.

Whether a firm follows a value-, performance-, or solution-driven computer strategy, management must choose what to buy and when. According to CAD consultant and author Brad Holtz, AIA, there are three main technology buying styles: early adopter, mainstream, and late adopter. Those firms focusing on the solution-driven, brain-work strategy like to adopt new technologies early, and as a result they pay more. They also gain a competitive advantage. Those firms that wait until technologies are mainstream before they buy pay much less, but they may earn a lower return on their investment. Mainstream users, like the performance-driven, strong-service firms, seek to optimize the cost/value tradeoff.



COMPUTERS PERMIT FREE-RANGING DESIGN EXPLORATION THAT WOULD BE DIFFICULT OR IMPOSSIBLE TO DO BY HAND.

WHAT IS YOUR FIRM'S TECHNOLOGY APPROACH

	TYPE OF FIRM		
	PROCEDURAL	GRAY HAIR	BRAIN
MARKET POSITION	STRONG DELIVERY	STRONG SERVICE	STRONG IDEAS
COMPUTER STRATEGY	VALUE-DRIVEN	PERFORMANCE-DRIVEN	SOLUTION-DRIVEN
PURCHASING APPROACH	LATE ADOPTER	MAINSTREAM	EARLY ADOPTER

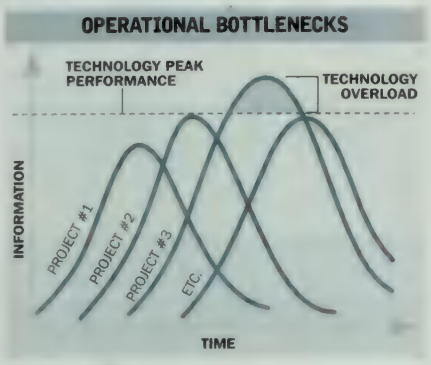
Choices in computer technology are driven by a firm's work style and market position. Most firms fall into one of the categories above.

How to apply technology strategy

Once a firm has identified a technology strategy that reflects and supports its overall practice, the next step is to apply that strategy to the development of a technology master plan. To be effective, the master plan must address both tactical and operational levels. At the tactical level, aligning the technology plan with the firm's marketing and financial plans is a key part of the process.

The first step, consistent with overall firm strategy, is to identify the markets the firm serves or wishes to serve, and the projects and services the firm seeks to deliver. The second is to determine the minimum level of technology necessary to support those markets, projects, and services. For example, some markets can be supported with simple 2D computer-aided drafting (CAD) and plain text general notes, while other markets may demand integrated 3D design and database-driven specification systems with live Internet links. The final step is to identify the maximum level of technology the firm can afford.

If the minimum technology needed to serve the firm's intended markets is less than or equal to the maximum technology the firm can afford, then the tactical planning process is complete. More often than not, however, the firm's technological reach exceeds its financial grasp. Failure to recognize and adjust for such mismatches is one of the most common causes of technology-based problems in all businesses, but



The digital demands of projects move in waves but have a steady impact on technology. When one project is too demanding, the computer system is overloaded.

especially in design practice. Project managers must learn not to over-promise or under-budget for technology to meet client expectations, while principals and financial managers must weed out projects that fail to return profits commensurate with technology investment.

The staff responsible for the technology must constantly be alert to potential bottlenecks in the firm's information-processing bandwidth, or total information-processing capacity. Even before computerization, design was an information-intensive process. A jotted note on the back of a business card could represent the initial project-lead information. During that project's life cycle, those initial jottings could expand to file drawers full of correspondence and flat files full of drawings. Eventually, the flow of project paperwork tapers off until the punchlist is closed out and the final retainage released.

With computers, the digital crescendo and decrescendo of project information follows the same pattern. In a busy firm many projects will overlap, each in its own stage of rising or falling information flow. The sum of these flows at any moment in time is the information capacity that must be accommodated.

Bottlenecks may occur in any number of places—in the calculating speed of the firm's hardware, the file-transfer speed of the software, or the learning speed of the firm's staff. Often, fixing one bottleneck reveals another new bottleneck. For example, new software may reveal a need for faster hardware, which requires upgraded network connections, which necessitates retraining users, who then demand new software, and so on. During the economically overheated second half of 1998, the bottleneck for many design firms has been a dearth of experienced technology support staff.

A simple way to keep track of this ever-escalating spiral is to craft a master plan that can be periodically revisited to address three straightforward questions: What are you doing? What could you be doing? What should you be doing?

Each of these three questions may be applied not only to the firm's technology operations as a whole but to each of three principal aspects of those operations: platform (software and hardware), procedure (standards, file exchange, etc.), and personnel (system administration, training, etc.). If you know where you are going and understand where it is possible to go (in terms of technology and competition), then it is not hard to target tactical implementations of the overall strategy.

Architects on the Net

In the last five years, the Internet and related technologies (intranets and extranets) have offered some of the best tools to create added value for design-firm clients. According to the AIA Firm Survey, 60 percent of architectural firms have Internet access and 28 percent either have a Web site or are planning to have one soon. Yet many practices rush from one fad and buzzword to the next, with little or no regard for the opportunity to leverage Internet technology in support of firm strategy. Rather than using the Internet to make themselves more like everyone else, design firms should be using the Net to make themselves the best at what they already do.

For example, E-mail and FTP (file transfer protocol) offer low-cost means of high-speed communication, a perfect prescription for leveraging procedural work. Client-accessible Web sites dedicated to specific projects provide strong-service firms an opportunity to extend their work directly into client organizations. For strong-idea firms, the best Web sites create immersive educational environments that compellingly convey their design philosophies.

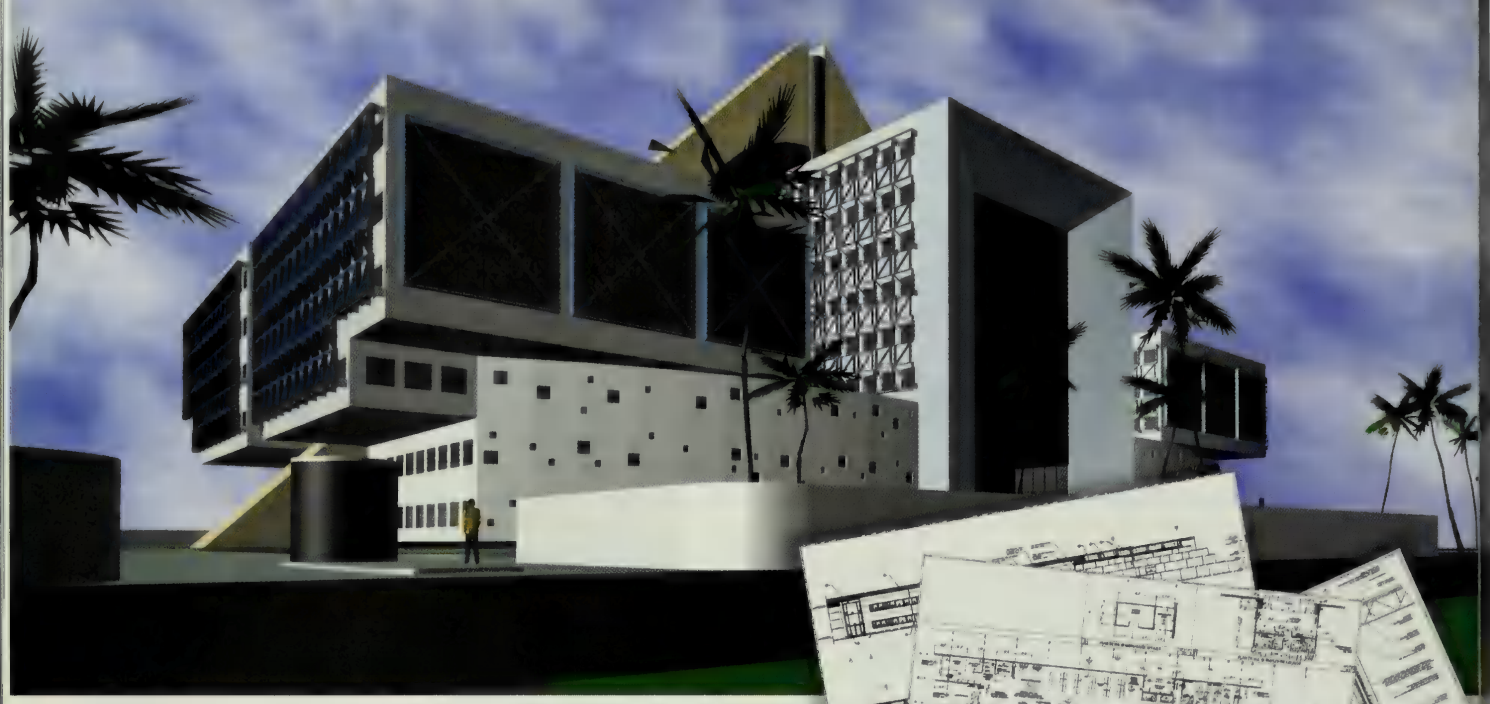
Who's in charge?

Successful implementation and operation plans recognize that the staff skills necessary for ongoing monitoring and support are not necessarily the same skills required for long-range strategizing. In too many design firms, technology management focuses on supporting PCs, programs, and protocols, instead of supporting people and projects.

At the end of the day, design practice is still about architects and their projects. PCs, programs, and peripherals should be simplified and standardized so they require as little attention as possible, and whatever system-support needs remain should be delegated to nondesign staff or, better yet, outsourced entirely. The overall management of design-firm technology is best kept in the hands of design professionals. Whether at the level of strategy, implementation, or operations, a user group or technology advisory committee should serve as a resource for the technology staff. The most successful technology advisory committees draw heavily on those who are closest to the client's perspective, including project managers and business development people, because ultimately the only sustainable reason for investing in technology is to create added value and service for the firm's clients. ■

PROJECT MANAGERS MUST LEARN NOT TO OVER-PROMISE OR UNDER-BUDGET FOR TECHNOLOGY TO MEET CLIENT EXPECTATIONS.





MiniCAD 7

a better way to design

But don't take our word for it...

MiniCAD recently went head-to-head against 12 of the world's top architectural CAD programs and won. A panel of 12 CAD industry experts and more than 400 design professionals in attendance at the annual Designers CADD Shootout voted MiniCAD the "Best Overall Architectural CADD Software". MiniCAD's ease-of-use, sophisticated 2D drafting tools, powerful 3D modeling tools and affordable price made it the clear winner.

Architects are often surprised to learn how affordable MiniCAD is—especially when they see the complete suite of architectural tools that are built right into the core program. Without purchasing a single add-on, this professional CAD program lets you create everything from precise working drawings to 3D client presentations and comprehensive materials lists. In fact, no other CAD program offers so much for so little.

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Overall Shootout Standings:

#1	MiniCAD7	$795	#7	DenebaCAD	$799
#2	AllPlan	$4995	#8	Architrion	$4000
#3	Triforma	$5325	#9	Architech.PC	$3500
#4	ArchiCAD	$4995	#10	Arc+/Virtus	$1595
#5	Arris	$4250	#11	BuildersCAD	$1995
#6	DataCAD	$249	#12	AutoCAD 14	$7250

CIRCLE 62 ON INQUIRY CARD

The Latest Software for Architects: Internet Solutions Abound

by Steven S. Ross

Intelligent objects. Web collaboration. Enterprise computing. These relatively new terms refer to innovations that are quite different from each other but which all contribute to one thing: owners, architects, engineers, and contractors actually talking to one another, continually, throughout the life of an entire project. At this year's trade shows, vendors demonstrated that it is possible to put an entire building, even maintenance manuals, into a computer.

All this is happening, oddly enough, without real agreement among vendors on data standards. Autodesk cut much of its support for the International Alliance for Interoperability, a nonprofit building-industry alliance it helped found, which is trying to create communications standards. And some long-standing relationships, such as the one between Sweet's and Autodesk, have ended. What vendors and design professionals do agree on is that the Internet in general, and the World Wide Web in particular, has enough glue to tie data exchange together in a cost-effective and relatively error-free way, even without absolute agreement on specific standards.

While many showgoers described the advances in Internet applications in terms of rapid communication between designers and construction sites, or between owners and tenants, these new applications have the potential to do much more. They can:

Produce a database of changes and the decisions leading to them.

Produce a final set of drawings that not only show exactly what was built, but also how to maintain it in the future.

Produce billing documents and data for other bookkeeping needs, in fraud-resistant ways.

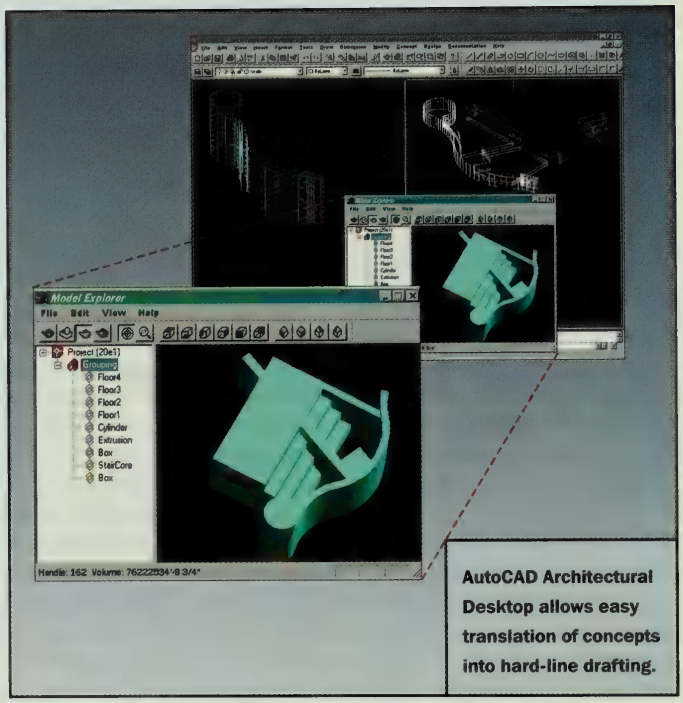
Measure project progress against budgets and schedules.

Allow members of a design team to look over each other's shoulders as decisions are hashed out, designing quality in from the beginning rather than correcting it later.

CAD software

Architects are being offered new, exciting choices in CAD software, often at drastically lower prices than just a year ago. Autodesk introduced AutoCAD Architectural Desktop, which incorporates the 3D technology it acquired in early 1997 when it bought Softdesk. At under $4,800, the package is priced about $1,000 less than was the combination of AutoCAD R14 and Softdesk Auto Architect a year ago, for a similar set of drawing tools. "We kept seeing copies of MicroStation TriForma and ArchiCAD in AutoCAD shops, copies purchased to do specific 3D stuff," said one top Autodesk official. "We can now do that, too."

With the introduction of IntelliCAD from Visio, the cost of AutoCAD R14 compatibility also dropped drastically. IntelliCAD saves its drawings in AutoCAD's R14 DWG format, producing files that do not need translation. The major exception: IntelliCAD does not save Autodesk ObjectARX entities. ObjectARX is a programming environment for AutoCAD R14 that can, among other things, make it easier to add functions to the program, make drafting easier, and help create intelligent objects. An intelligent object is an element in a drawing that behaves according to certain properties: an "intelligent" door, for example, will not let itself be placed where it couldn't open; an intelligent screw will "know" how far into an object it will penetrate. (Visio says it will use object technology from Microsoft instead.)

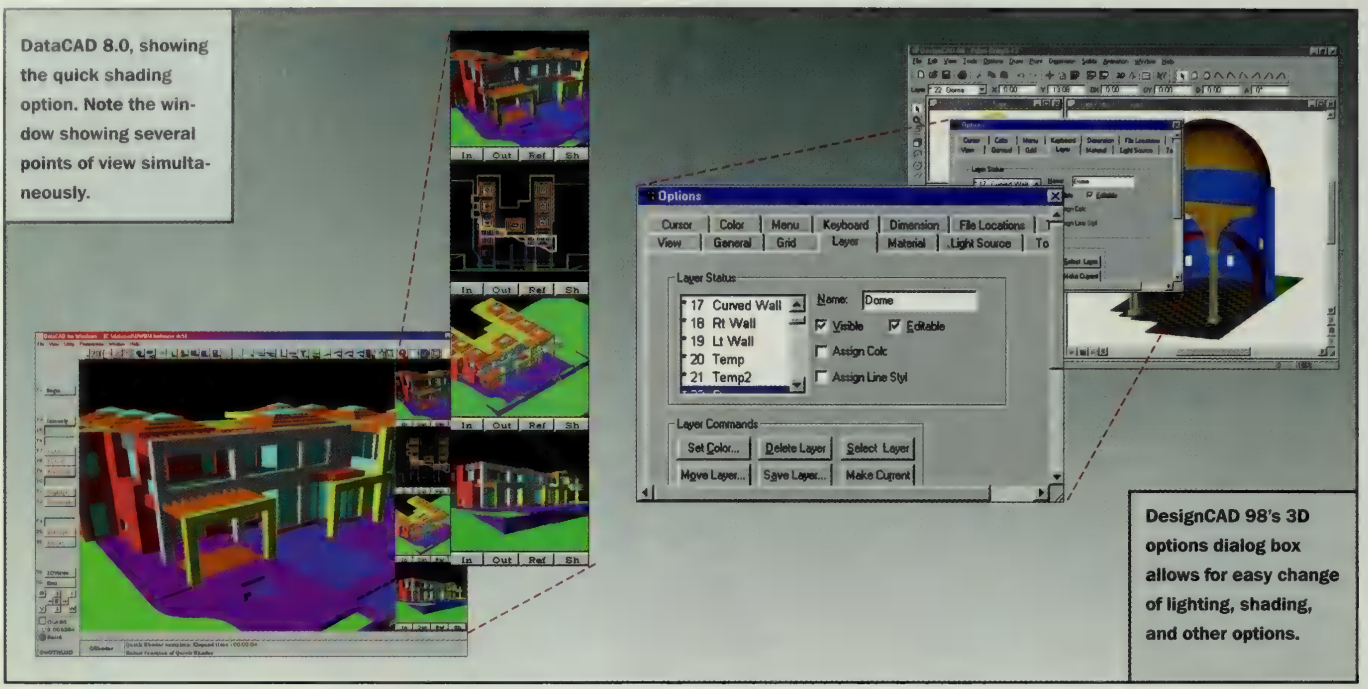


AutoCAD Architectural Desktop allows easy translation of concepts into hard-line drafting.

In June, Visio bought ArchT from Ketiv and combined it with IntelliCAD. A CD with IntelliCAD and two fully licensed versions of ArchT, one for use with AutoCAD R14, the other for simultaneous use with IntelliCAD, lists for $695. ArchT adds easy ways to draw stairs, roofs, and other features to both CAD programs. With the combination, Visio can market IntelliCad to firms that need to add AutoCAD-compatible seats while keeping AutoCAD as their standard drafting package.

There has been, however, plenty of talk about glitches in IntelliCAD. Associative dimensioning, for instance, does not work quite right. Expand a cross-hatched area in IntelliCAD and move it back to AutoCAD,

Contributing editor Steven S. Ross has been reviewing software and hardware for this magazine for 11 years.



DataCAD 8.0, showing the quick shading option. Note the window showing several points of view simultaneously.

DesignCAD 98's 3D options dialog box allows for easy change of lighting, shading, and other options.

and the crosshatch may not match the new boundaries. Autodesk also seems to have fiddled with the DWG file format, to keep Visio off balance.

At the A/E/C Systems show, Autodesk argued that when one calculates the overall cost of a CAD seat, including hardware and training costs, the cost of its software is small. And, it added, the cost of slight file incompatibilities can be high.

Autodesk showed its Actrix package for the first time at A/E/C Systems. Actrix looks like Visio's technical drawing package on steroids. It will ship this fall with numerous objects, mainly for plant and office layout. Actrix accepts AutoCAD R14 files, though when files are imported back into AutoCAD, the Actrix objects lose their intelligence, turning into plain blocks. Within Actrix, the symbols are smart enough to perform such tricks as aligning with walls automatically. Visio, in turn, debuted its Technical 5.0 package at PC Expo in New York, a week after A/E/C Systems. Visio says it hopes to have a common core for Technical 5.0 and IntelliCAD, which would allow symbols' intelligence to be preserved as they're passed between the systems, ready by 1999.

Visio's Technical 5.0 is 2D. But an independent vendor, Lomasoft, has figured out a way to generate interactive 3D views from Visio files. Its product, 3D ShapeView, links to Visio through Microsoft's Visual Basic for Applications (VBA). The output is in VRML (viewable on any 1998-vintage Web browser) or DirectX (a Microsoft 3D standard).

Bentley Systems released MicroStation/J for beta testing in June, with the final product slated to ship later in the year. We first reported on MicroStation/J, the first object-oriented version of MicroStation to compete with AutoCAD, last year. It relies on Java rather than Microsoft or ObjectARX tools to create and manage objects, which makes it easier to translate MicroStation/J to non-Windows operating systems such as Unix or Macintosh. One trick: Bentley expects to be able to read and write AutoCAD files without ever translating them into MicroStation's own format. Instead, it might use Java to write new drawing entities to the DWG database, and pull them out for screen display.

Intergraph announced that Microsoft will include Imagination Engineer LE 2.0, a limited, upgradable version of its 2D sketch and drafting program Imagineer Technical, in its Windows 98 Resource Kit.

Though Nemetschek has slowed its marketing efforts in the United States, it has released a great AutoCAD drafting and 3D add-on, PalladioX. According to Autodesk, it is the first add-on that uses Autodesk-certified ObjectARX technology.

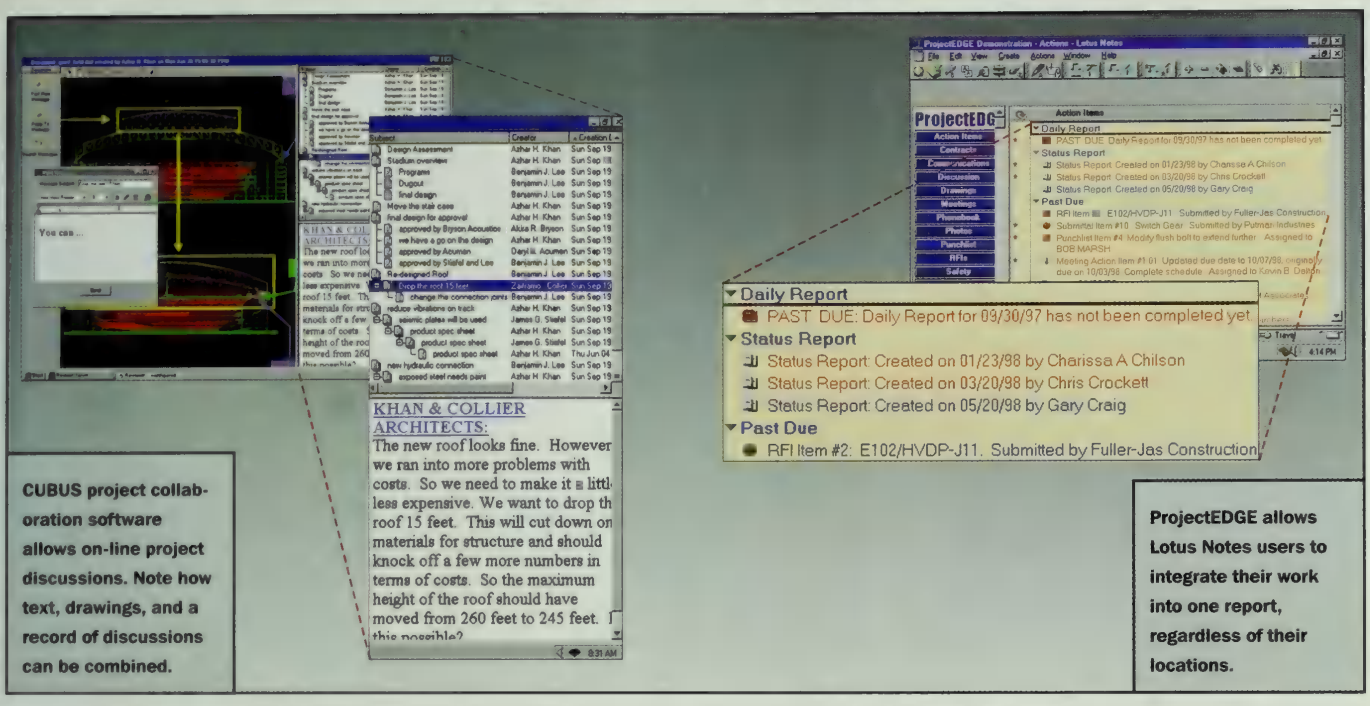
Furukawa Information Technology (FIT) released version 8 of CADVANCE this past spring. CADVANCE was the first full-featured CAD package for Windows, but the developer fell on hard times and the system stagnated. With this version FIT catches up to the pack, thanks to impressive compatibility with Windows' utilities and a Multiple Document Interface (you can open as many drawings as you want). There's also a translator that supports AutoCAD R14 files, including XREF files. The company offers a free 30-day trial.

Now that Softdesk has been absorbed into Autodesk, several firms into Bentley, and part of Ketiv into Visio, Eagle Point is the only broad-based independent provider of basic add-on CAD software. At A/E/C Systems, it showed what it calls CALM technology, which allows the same add-on application to run on AutoCAD, MicroStation, and IntelliCAD.

At A/E/C Systems, Sigma Design and BAGH showed versions of their CAD packages (Arris and Architrion, respectively) running on the Silicon Graphics O2, a UNIX workstation priced under $6,000. Bentley showed an SGI version of MicroStation TriForma as well.

Diehl Graphsoft was celebrating its $595 MiniCAD 7 for winning the Designers 3D CADD Shootout at Build Boston, a three-hour competition among 12 CAD packages. The Mac and Windows versions are tuned for architecture and are particularly good when working from plan. Floor plans and elevations go together easily, and rendering is fast.

Another package that continues to acquire additional production drafting tools is ArchiCAD from Graphisoft. Version 6.0 allows a drawing to be edited in 3D perspective or axonometric view. Walls and columns automatically place themselves on the floor beneath, without the operator having to set a Z coordinate. Translation from AutoCAD R14 preserves XREF links (drawings linked to other drawings) and intelligent objects. ArchiCAD 6.0 can publish directly to the Web, using Simplified



CUBUS project collaboration software allows on-line project discussions. Note how text, drawings, and a record of discussions can be combined.

ProjectEDGE allows Lotus Notes users to integrate their work into one report, regardless of their locations.

Vector Format (SVF). In ArchiCAD for TeamWork, a version that allows collaboration among drafters on a network, workspace boundaries—which define what portion of a drawing a user can work on—can now be changed on the fly. And Art•lantis Render, included with ArchiCAD, can now output QuickTime VR animation in real-time.

DynaCADD 98, the latest version of Ditek's 2D/3D drafting, modeling, and rendering package, was shown at A/E/C Systems and began shipping a month later. Like MiniCAD 7, this package offers lots of features at a low price.

DataCAD LLC, which had been a bit behind in the introduction of a true 32-bit Windows 95/NT version of its software, released DataCAD 8.0 in May. It ships with DC Viewer, a stand-alone application for viewing DataCAD drawings, and Visual Reality 2.0, a 32-bit animation and presentation package. The introductory price is $495.

IMSI's TurboCAD's new release includes voice input for commands and is faster overall. Also at the low end in terms of cost (and particularly compelling for corporate buyers) is DesignCAD from ViaGrafix. The latest version of this 2D/3D drafting package has faster shading, layer improvements, and more flexible print options.

Mainly for models

The number of modeling packages continues to expand. But choose carefully—these products have wildly different user interfaces and file formats. Some are strong on modeling, others on visualization or animation. Most offer demo versions you can try with your existing projects.

Ashlar, which is normally associated with production 2D drafting, shipped Vellum Solids in June. Its core is the industry-standard ACIS solids modeling engine (4.2), but the interface is pure Vellum, with a drafting assistant that identifies edges, midpoints, and so forth. The company is pitching the product as a bridge between 2D and 3D; it's ideal for modeling those pesky details, which can then be imported into architect-oriented drafting programs.

If you already have a structure and you want to build a 3D model based on it, consider 3D Builder Pro 3.0 from 3D Construction Company. It builds a 3D model from two 2D photos. The new version, significantly faster than old ones, is great for interiors.

Piranesi, from Informatix Software International, creates an entirely new category: it's a 3D paint program capable of photorealistic effects. You can use it to dress up a 3D CAD image. In the hands of a talented user, the result is a more artistically pleasing model than an entirely computer-generated 3D rendering.

Kinetix, a division of Autodesk, released R2 of its 3D Studio VIZ. This modeling and animation package, tuned for architects and engineers, now dynamically links to AutoCAD R14 and ObjectARX files. Change the R14 file, and the 3D Studio file changes, and vice versa. Digital Media Interactive offers Lucidity RT, a VIZ plug-in that allows full-screen, full-motion 3D interactive video authoring with photorealistic detail.

Microsoft was expected to be a major competitor to Kinetix, but the software giant quietly gave up and sold its SoftImage division to AVID—a company focused on the film end of the business, not specifically on 3D visualization and animation.

Discreet Logic's Lightscape 3.1 showed up this year as a free-standing visualization tool (we reviewed it in June), and is built into many CAD packages. It now runs in Windows 95 and 98 as well as NT.

Among the enhancements in version 3.0 of form-Z, due this fall from auto.des.sys for both Mac and Windows, are more customizable palettes, continuous drawing from one window to another, better snapping and alignment, faster rubber-banding, primitive shapes with personalities, output to AVI and QuickTime VR, and new drafting tools.

IMSI introduced Multimedia Fusion, a successor to the popular Corel Click & Create software for multimedia presentations and animations. The upgrade price is under $80, and the introductory price for new users is $99.95.

Project management software

The big news is in clever, easy-to-use project and financial management, facilities management, and space planning software. The number of offerings exploded in 1998.

Semaphore showed its SEMA4 financial management package for Windows. Its remote-entry abilities for such items as time sheets and billing continue to improve.

Primavera showed version 6.0 of its Expedition contract control software, which offers strong Web ties. The product was due to ship at press time. The company also sells Webster, a communications package for its Primavera Project Planner (P3) and SureTrak project management software. Primavera also announced that SAP has certified a two-way data exchange interface between P3 and super-high-end SAP R/3 management software.

Axium's Protrax project control, invoicing, and accounting software can interact with any Windows-standard ODBC database. The company's pedigree is important for upgraders: Axium is a 1993 spinoff from Timberline (whose old name was CPA Systems), and acquired Timberline's DOS-based A/E line in 1996. Protrax is the Windows 95/98/NT successor to A/E.

Paragon acquired the project management technology and customers of Combase. The interface is intuitive, and the on-screen presentation looks like a tab binder.

Lotus Notes users might be interested in ProjectEDGE, from Edgewater Services Co, which can integrate the work of all project participants regardless of their location.

Meridian introduced Prolog Manager 5.0, which allows project team members to track submittals, meeting minutes, punchlist items, payment applications, change orders, and other project information over the Internet using a single project database. Remote users can print live reports that include more up-to-the-minute information than reports published ahead of time on a Web page. It's due later this year.

The number of professional-quality packages for employee scheduling and time-tracking as well as general accounting continued to grow, in part because of encouragement from Microsoft (which sells attractively priced small-business software for up to 25 users) and in part because of database technology available to Windows and Macintosh users. Among the new and upgraded products: IMSI's PeopleScheduler; Sage's general bookkeeping and time-tracking packages; WRQ's engineering and architecture-oriented packages; and Proven Edge Professional. All help with bookkeeping tasks.

RFP's marketing package can use your firm's project and talent database to create proposals in SF 254/255 and other formats.

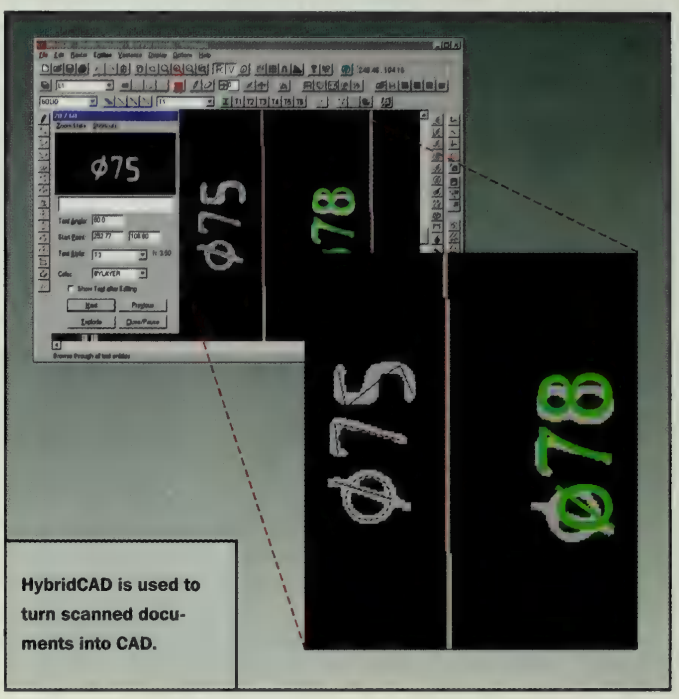
Along with the usual displays of quality how-to books, Viagrafix showed its broad line of CD-based training materials. Especially notable were the firm's discs on programming with Java and Visual Basic—ideal for systems people who need some reorientation toward these languages in order to build mini-applications that tie bigger packages together.

Facilities management

The Web and the ability of architects to deliver facilities-management-ready drawings has spurred many new entries into the field of computer-aided facilities management (CAFM). Some systems started out as facilities management packages, some as CAD products, others as databases.

Archibus/FM, the popular facilities management package, now has a new browserlike interface. Toolbars lock onto the screen's left edge to provide such aids as visual cue cards, crib notes, and flow charts that act as a wizard to walk you through the FM process.

Aperture Technologies showed its comprehensive FM software suite. The package accepts AutoCAD DWG, Bentley DGN, or DXF floor-



HybridCAD is used to turn scanned documents into CAD.

plan and symbol files, allowing users to categorize different types of spaces on the plan. It also includes a personnel manager for planning moves and changes, and furniture and equipment manager modules for photos, maintenance contracts, and documenting inventory.

FM:Space software and the FM:Web plug-in (based on Autodesk's Whip plug-in) from FM:Systems allow monitoring of space uses and moves. Innovative Tech Systems' Span-FM family of facilities management modules is strong on tracking labor and other indirect costs.

Facilities Information Systems' FIS/FM allows the merging of separate databases to coordinate moves and temporary or transient worker space (hoteling), inventory, space planning, facility drawings, and more.

Deltek Systems, which has long offered time management and accounting software, announced at A/E/C Systems that its flagship product, the Costpoint accounting system, would soon get a secure interface to Primavera's P3 (Deltek's older System 1 accounting package has long had a P3 interface). Deltek also announced that it had purchased the FM software vendor Harper and Shuman. As all these products become integrated, architects will be able to record costs and payments in project planning software and have the data cascade down into cost-tracking and accounts payable. It was unclear how Harper and Shuman's Advantage enterprise accounting system would be enhanced in the future; Deltek already supports several other enterprise accounting packages.

Framework Technologies showed ActiveProject 3.0 (formerly called Aspects), for building and managing project Web sites. It uses Rasterex, Expert Graphic's popular viewer for AutoCAD, MicroStation, and other files. Site construction is almost trivially easy—just drag and drop. There's a server product as well, for Web publishing.

WorkPlace System Solutions, a strategic affiliate of Bentley, showed ActiveAsset Manager, for tracking and organizing a facility's lifecycle data. Its ActiveAsset Planner helps with the actual facilities management chores.

Drawbase offers a combined CAD/CAFM package with an integrated database. It can design, draw, track, and manage facilities, and is being positioned for facilities management.

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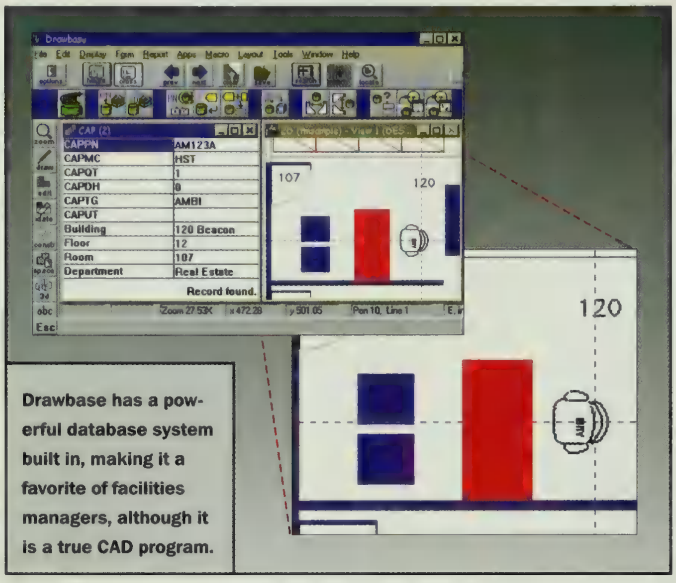
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Drawbase has a powerful database system built in, making it a favorite of facilities managers, although it is a true CAD program.

Drawing and data distribution

New Web solutions abounded at this year's trade shows. These packages all do more than document viewing and redlining. Docupoint released its Whip-n-Post converter, which automatically turns AutoCAD DWG files into the DWF format for posting on the Web. A single-user, nontransferable copy has been available as a free download on the Docupoint site (www.docu-point.com) since June.

MP Interactive introduced an enhanced version of e-Builder. The program lets architects, contractors, clients, and others share project files and even chat over the Web. You don't need your own Internet server; MP Interactive hosts project-specific Web sites for you.

If you don't have a Web server, but do have Novell 4.0 or higher and a Windows NT server, consider Computhink's Paperless Office; it supports popular scanners and full-text search and document retrieval. The interface looks like Microsoft's Internet Explorer.

Cubus, which released its ReviewIt project collaboration Web package in January, offered a free evaluation deal at the June A/E/C show. The program logs and archives all discussion about a design.

The Rasterex group at Expert Graphics released a host of new and enhanced products for viewing graphics; for scan-enabling AutoCAD LT 97; for editing and converting raster images inside AutoCAD; and for managing large numbers of project files.

WorkPlace Solutions sells the new ProjectWise Extranet; used with Bentley's ModelServer, it can make publishing project documents on the Web easier.

RenderView Software offers Engineering Office for Windows 95, 98, and NT. The Web-publishing package can handle only about 30 file formats, but it handles all the major ones and runs on slow machines.

Drawing management

Drawing management software can handle XREF filing, Web viewing, and document archiving. Plain image-viewer packages are faster, cheaper, and more versatile; some packages that started as viewers seem on the verge of becoming plotter managers.

Cimmetry Systems enhanced its AutoVue and AutoVue Professional file viewing, document management, and redlining tools. It also released a 3D viewer, AutoVue SolidModel Professional, with support for CATIA and almost 200 other file formats including AutoCAD and MicroStation. The AutoView line is Web-enabled (there's a browser plug-in). Cimmetry products are also compatible with DOCS Open, Documentum EDMS, FileNet, Matrix, and Lotus Notes/Domino, among others.

Cyco released AutoManager WorkFlow 6.0, the latest version of its document management and viewing software, this summer. It supports IntelliCAD, direct scanning, and Cyco's Internet Publishing Tool, which converts AutoManager's card views into HTML so they can be viewed with Web browsers equipped with the AutoManager plug-in. Users can view, zoom, scale, pan, and print the document right from the browser. If you're using other software to manage documents, consider AutoManager View 2 for viewing and E-mailing document files.

Spicer Corporation also added Web-publishing tools to its Imagenation for Windows. Version 4.5 can output to JPEG, GIF, and PDF (Acrobat) formats. It can handle redlining and document markup in 12 languages, too. Spicer's DocuJet print driver utility is now totally compatible with Windows 95/98/NT.

SoftSource released Vdraft Internet Tools for AutoCAD R14. The plug-in allows users to view, print, and save R14 DWG and DXF drawings from Netscape or Microsoft browsers.

Softelec showed its new VPstudio, a pricey but comprehensive vector-and-raster editing tool meant for facilities managers and large-volume users. The firm has six other packages that offer progressively fewer features. Prices range from $600 to $5,000.

Vendor data

How will vendor data be distributed to architects for inclusion in drawing files? A few years ago private publishers thought they would aggregate information from materials vendors. Now most vendors say they'll do it themselves, over the Internet.

BSD SoftLink Products upgraded its BSD CostLink and BSD SpecLink specification and cost-management data packages. They are compatible with data from RS Means, Richardson Engineering, and others. It's also easy to add in-house data to them. CADSPEC introduced its Web-based VisuaLibrary of more than 9,000 A/E/C companies, building product information, CAD details, specifications, and more.

Wiley released version 2.0 of its Architectural Graphic Standards CD-ROM, which includes more than 5,000 drawings (see Books, page 38) and now supports AutoCAD DWG and DXF files as well as MicroStation DGN. The CD-ROM also links to more than 2,000 industry suppliers' Web sites, including the Architects First Source product vendor listings.

Sweet's, which formerly collaborated with Autodesk to produce details called Design Blocks on CD-ROM, is now handling the task alone with its new product, CD\CAD. CD\CAD provides four sets of CAD details on disks each year, in DXF as well as AutoCAD R14 DWG formats.

At A/E/C Systems, the International Alliance for Interoperability demonstrated the benefits of intelligence in CAD models. In one demonstration, the design of a small bank building was checked for thermal performance and for compliance with energy codes. In another, an office building was remodeled; the original design drawings were converted to an intelligent model following IAI standards. The HVAC system was then redesigned with a model-driven cost estimate.

IAI released version 1.5 of its first set of Industry Foundation Classes in March. Release 2.0 is scheduled for next spring, with applications for architecture, HVAC, cost estimating, facilities management, and building-code checking. Autodesk has cut back its support, but IAI has been picking up backing from many small vendors and professional groups around the world. ■

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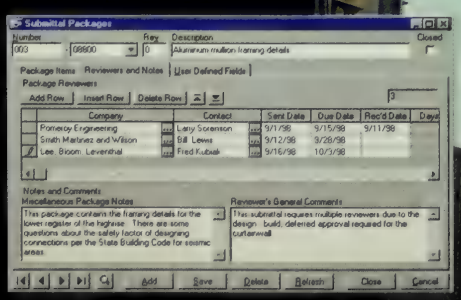
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CIRCLE 41 ON INQUIRY CARD

Exploiting Advances in Computer-Aided Architecture: Five Case Studies

by B. J. Novitski

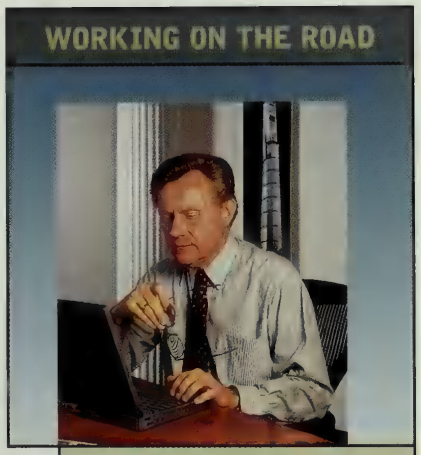
There's no question that technology has transformed our work lives. Professional advancement means keeping up with the times: scribes and blacksmiths, who were once commonplace workers performing vital, everyday tasks, would now have a hard time finding documents to copy and horses to shoe. The good news is that the computer, the very technology that has been steadily putting the pencil out of work, has the potential to reinvigorate architects' leadership role in the construction industry. But this revitalization requires that architects exploit computer technology to expand the arts and skills they already bring to the design and construction team. Unfortunately, the well-intentioned computer hype during the past 15 years has probably miscast the role of the technology in architects' offices. It is not a panacea that can instantly make the problems and complexity of professional practice disappear. Instead, the technological environment is one of gradual change, where innovative people, taking incremental steps, and sometimes missteps, move toward making their complex work better. In small stages, architects' work is becoming a little smoother, a little faster, a little easier, and a lot smarter.

HLW BREAKS FREE OF LEGACY TECHNOLOGY

Founded in 1885, ***HLW International*** *provides services in architecture, engineering, planning, interior architecture, and landscape architecture. Besides its New York headquarters, the 300-person firm has offices in Los Angeles, San Francisco, Chicago, Boston, Shanghai, and London.*

One bitter irony experienced by design firms who adopted computers early on is that just at the point when others are jumping on the bandwagon with the slickest new technology, they're burdened by aging legacy hardware and software. Such was the dilemma facing the architecture/engineering firm HLW International. They had bought into technology in the early 1980s, when other firms were still content with drafting tables and pencils. After more than a decade of loyal service, though, their once very expensive Unix-based CAD workstations had little more computing power than an obsolete 286 personal computer. And the machines' limited software was restraining the communications capabilities of the staff. The Unix CAD users, for example, didn't have access to the basic word processing or spreadsheet functions the administrative staff had on their PCs.

Mobilizing the 250-person New York office for change proved a major operation. To head up the massive upgrade, the firm hired architect Paul Seletsky as director of information technology. "Choosing him over a computer professional was part of our management strategy," recalls CEO and senior managing partner Leevi Kiil. "We wanted to ensure that all changes would serve the professional goals of the firm."



HLW International's CEO Leevi Kiil uses one of the firm's 50 notebook computers to track projects when traveling outside the office.

The hardware upgrade involved rewiring 60,000 square feet on two floors of their building in lower Manhattan, replacing old telephone wiring with Category 5 cabling to support a fast 100 Base-T Ethernet local-area network. The servers were replaced and redundant connections were installed so data wouldn't be lost in case of fire. Unix workstations were replaced with fast Pentium PCs, and the old Intergraph CAD software with MicroStation 95. Each desktop now runs Windows NT and MS Office 97, and E-mail and Internet access are provided to all staff. To ensure that the firm doesn't go too long before the next upgrade, all of the equipment is now on a five-year lease with a three-year renewal option. Remote-access computing was introduced at the same time. The firm bought 50 notebook computers for managers working outside the office and set up secure Internet connections for each to an office server.

Performing this upgrade and the accompanying renovations without disrupting the staff was a logistical challenge for the firm's operations department and a team of HLW employees whose sole job during this time was overseeing the move. One at a time, studios were temporarily relocated while the tightly coordinated trades moved in and did their work, in one week per studio. In nine months, the entire office was transformed.

The software upgrade now being studied will move designers from 2D CAD to 3D modeling. Seletsky explains: "We'll be starting projects with 3D models and extracting the plans, sections, and elevations from them as opposed to the automated pencil we're using now. Now that we've got the new technology, we'll be able to transform the way we work, particularly in terms of Web-based communications." In addition, the firm is organizing a centralized database that will coordinate the management and financial monitoring of its projects.

B. J. Novitski is a contributing editor of RECORD. She is author of Rendering Real and Imagined Buildings: The Art of Computer Modeling from the Palace of Kublai Khan to Le Corbusier's Villas, *coming from Rockport Publishers this fall.*

A FIRM THAT MAKES FINANCIAL INFORMATION SYSTEMS DO DOUBLE DUTY

__Wiley & Wilson__ is a 97-year-old, 125-person full-service design firm. The firm serves industrial corporations, educational institutions, and government clients, primarily in the Southeast. Long-term clients include the Colonial Williamsburg Foundation, the Department of Defense, and the White House.

A valuable yet arguably underappreciated benefit of the paperless office is the accessibility of data in digital form. The true power of the "information age" comes from the ability to learn from patterns in information collected over time. Whereas paper archives have an indisputable longevity, they do not readily reveal such trends.

At the architecture, engineering, and planning firm of Wiley & Wilson, headquartered in Lynchburg, Virginia, vice president Russell Griffin, CPA, has been exploring the capabilities of financial management software to improve the firm's operations in project management and marketing as well as in administration. The Harper and Shuman Computer-based Financial Management System (CFMS), which Wiley & Wilson uses for its financial reports, has long been a favorite among A/E firms. It supports a variety of tasks such as budgeting, billing, payroll, accounts payable and receivable, and a wide range of customized reports.

Because the software is geared specifically toward project-oriented firms, it also supports the time-accounting procedures needed in project management. When employees post their weekly time sheets to the system, a project manager can compare time and fees spent with time and fees allotted to the job and with the percent of project completion.

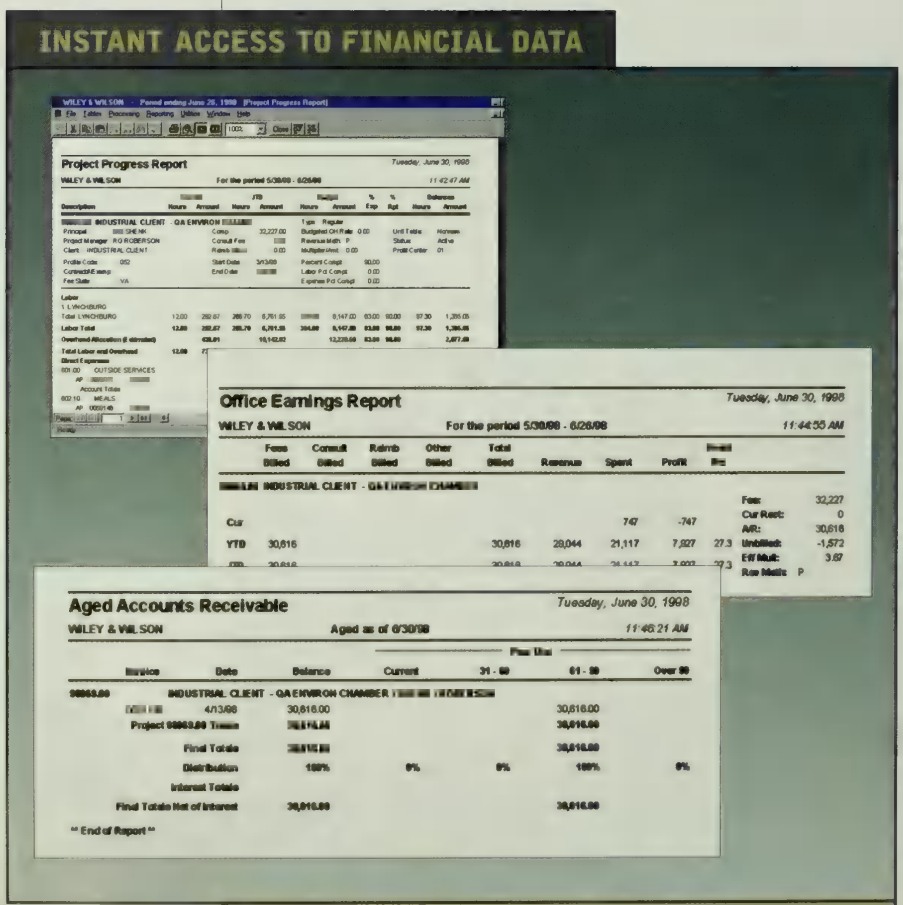
This lets managers know whether the design team is progressing according to the time and budget allotted to the project. For example, if managers discover that 50 percent of the fee has been spent and only 30 percent of the project is complete, they know immediately that measures must be taken to streamline work processes, redefine the scope of the project, or find some other way to compensate for the discrepancy. Discovering such problems early on is essential to solving them with a minimum of pain and harm to profit.

Wiley & Wilson gets this information quickly and can forward it instantly to project managers. "We used to print out reports for distribution," Griffin says, "so they weren't reviewed until several days after the time sheets were posted." Time sheets are now posted directly from the employee's desktop, and the project manager can log onto the system and immediately evaluate the project status.

"Twenty years ago," Griffin adds, "financial information was used more by the owners. Now project managers are using this information to identify where changes might be needed. I can recall times when a review of financial information has helped us decide to talk to the client about a change order or a change to the scope of the work." Detailed information about the financial status of the firm is still the private domain of the firm principals and their bankers, but because the program can disseminate other data on a "need to know" basis, project managers have access to the timely information they need.

Griffin is particularly excited about the ability of the new system to analyze the firm's financial history. "Under the old system," he explains, "we could only see the current reporting period's data—whether it was a week, a month, or a fiscal year—on screen. Once we left a period, we'd have to go back to the paper archive to examine any detail. Now we can examine past data to complement our financial forecasting. For example, we can ask the system to identify any project that has accounts receivable over 45 days old. We can also identify project profits by individual client, client type, or market area to see how we're performing. That could help our marketing people determine what direction they need to take in the future."

Harper and Shuman's CFMS/Advantage software, which provides this database capability, has recently been upgraded to work with Microsoft's SQL Server and is thus now suitable for firms of all sizes. Harper and Shuman itself has been recently purchased by Deltek Systems, Inc., which specializes in support software for large project-oriented companies.



Wiley & Wilson uses software that provides database capability over a server. Data that might once have been accessible only by examining paper archives can be seen at the desktop.

GRABBING PRODUCT DATA AT THE DESKTOP

Collaborative Design Architects is a 19-year-old, 25-person architecture firm. CDA specializes in planning, programming, and architectural design for both commercial and public clients, including dozens of Bay Area municipalities. The firm also offers engineering and landscape design services through integrated teamwork with consultants.

Over the past few years, many energetic entrepreneurs have started up software development companies aimed at bringing building product manufacturers' data to the architect's desktop. Their goal was to provide drawings and specifications that architects could place directly in their digital documents. Many of them failed, though, because of the lack of preparedness and standards among manufacturers and the absence of a practical distribution system.

The Internet has alleviated much of the distribution problem and a young company, CADSPEC, is working with manufacturers to overcome the standards barriers. CADSPEC's VisuaLibrary is a Web site that offers a wealth of product data. Users can find detail drawings, specifications, application photographs, and technical information, then download them and incorporate them into their own design and construction documents. They can search for information by manufacturer name, by CSI division, or by keyword.

Unlike other architecture/engineering Web sites that simply provide links to manufacturers' sites, VisuaLibrary contains information crafted specifically for use by architects. CADSPEC now has standardized data for 400 manufacturers (more are added every day), and has additional Web links to thousands of others.

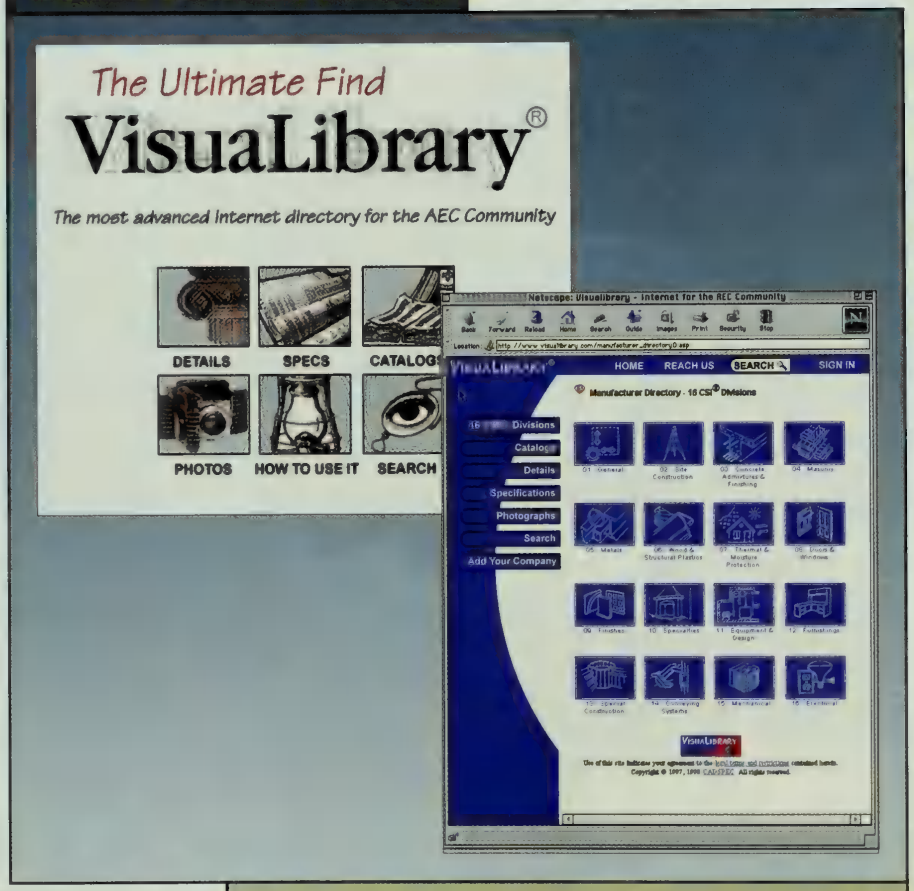
"This window to the manufacturers' literature is presented from the designer's point of view," says Thomas Clark, project manager with Collaborative Design Architects, Inc., (CDA) in San Francisco. "You don't have to weed through the manufacturers' promotional, marketing, or corporate information," he adds. "But if you need more detail, you can always link to their sites." Clark has been observing trends in electronic product data for 10 years. In the past, he notes, although written specifications in word processing formats were useful, most graphic data lacked standard formats and consistent accuracy. By contrast, he says, "CADSPEC understands the architect's needs, and VisuaLibrary is very intuitive in use. Its information is current, and being on the Web, it's easily accessible. And a lot of the searching can be done in the background, while you continue to work on your drawing, which, when added up over 25 employees, saves a lot of time for the firm."

In addition to its current efficiency advantages, one of the greatest benefits of this technology, Clark says, is in how it is preparing the CDA staff for even more powerful applications that should arrive in the next five years. On the horizon, for example, are object-oriented systems. When an architect selects an object to place in a drawing, information about its specifications and costing and technical analysis can be automatically placed throughout the rest of the documents.

"Although manufacturers haven't caught on yet to the potential of object-oriented systems, the software developers have," Clark reports. "Autodesk's Architectural Desktop, for example, supports object components that embody graphic and nongraphic information." In the future, he continues, manufacturers will be able to provide information-laden objects on their Web sites. If an object-oriented file of a door were added to a drawing, information such as the door's color, sound coefficient, and fire rating would be acquired along with its dimensions. "This will be really revolutionary," Clark says. "We'll have the infrastructure to move information directly from the manufacturer to the design drawing."

However, with the capability of object-oriented files to add so much information automatically, there is also the danger that data entered in error will go unnoticed. Architects will still need to take the time and apply their traditional expertise toward evaluating the data they're given. "You have to examine a detail and determine if it's the appropriate one, just as you would today," Clark cautions. "So now we're training our employees to take advantage of this technology. But we still want them to be very savvy about what's valuable and what isn't."

A GIANT PORTABLE CATALOG

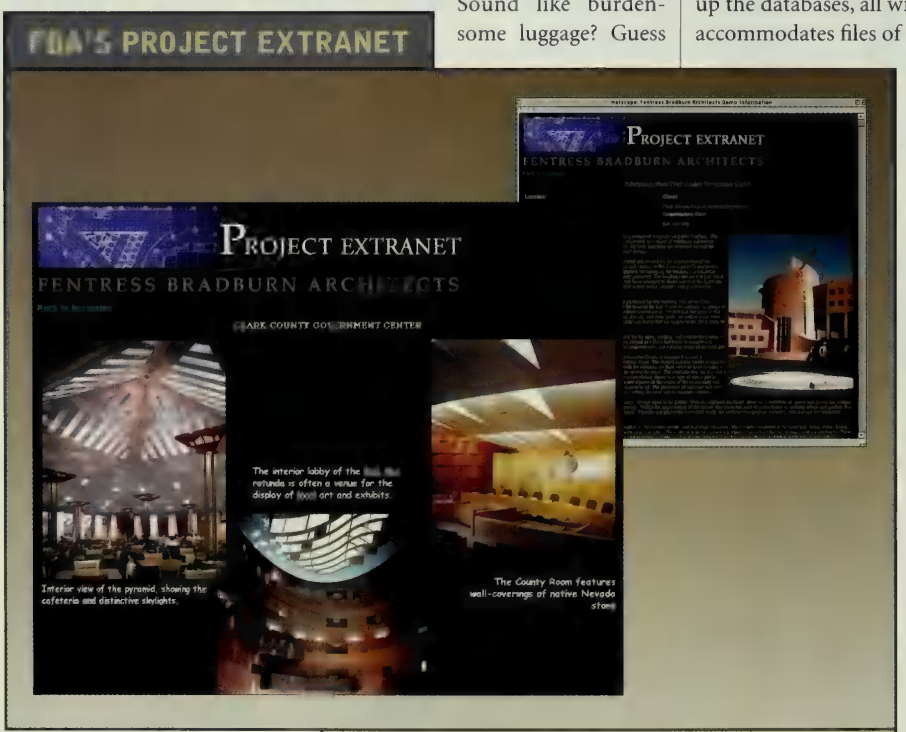


CADSPEC's VisuaLibrary Web site is a portal to a wealth of product data. Users can find drawings, specifications, photographs, and technical information and download it to their construction documents. VisuaLibrary can search for this information while the user continues to draw, making it a time saver.

THE EXTRANET: THE NEXT BIG STEP IN PROJECT COMMUNICATIONS

Fentress Bradburn Architects works on international projects and has offices in Denver, Oakland, Toronto, Frankfurt, and Doha, Quatar. The firm's practice includes architecture, facilities programming, master planning, interior design, zoning and environmental approvals, and development consulting services.

When architect Mark Rothman goes on the road, he packs a complete set of drawings, specifications, and notes for six ongoing building projects. As director of information technology for award-winning Fentress Bradburn Architects (FBA), he also takes all the equipment he needs for direct communications to the firm's consultants, clients, and contractors. Sound like burdensome luggage? Guess again: it all fits in his briefcase. In fact, the "mini-laptop" Rothman uses to manage all this information is smaller than most portable computers. Its size and weight were important considerations to its being added to FBA's technology suite.



Using their extranet, Fentress Bradburn Architects team members can review almost any type of document, and exchange E-mail with the rest of the team.

Most architects understand the power of digital file sharing and communications. They send drawings on disk to their consultants and install electronic mail systems in their offices. To promote data sharing still further, some extend Internet technologies to intranets (in-house networks) and FTP (file transfer protocol) sites from which outsiders can download files. As effective as these may be, though, they lack a method for bringing all this information together under the control of a logical, unified project management system.

Enter the "project extranet." This concept, barely heard of two years ago, has become the technology darling of 1998. In a nutshell, it is a limited-access Web site that brings together all project data for use by everyone on a project team. In some cases, firms buy or write the software to make the system work. In other cases, they subscribe to a service that maintains the site for them.

FBA prides itself on being at the forefront of technological advances, so the company didn't care for the idea of subscribing to an outside service. They were not keen to transfer hundreds of large files to a service bureau that was probably also working with their competitors, and they wanted to maintain in-house control of their own drawings and project management data. At the same time, they wanted to avoid the hassle of constantly maintaining the links between documents, which is necessary to keep an ordinary Web site functioning.

The firm chose ProjectWise from Workplace System Solutions for their extranet. Workplace licenses software and sends a "rapid deployment team" to install the software, customize the interface, and set up the databases, all within 48 hours. The result is a unified system that accommodates files of virtually every type: MicroStation and AutoCAD drawing files, databases, word processing files, Primavera schedules, and so on. The ProjectWise infrastructure organizes the material logically so that it is easy to find. Importantly, it is also easy to ascertain who has seen what, when. As new information comes in, new Web pages are created automatically, without the constant vigilance of a Webmaster. Each user has secure access to the appropriate set of information and is informed at log-on about anything new.

Depending on their technical expertise and their need to interact with the data, users can approach the extranet with simple point-and-click browsers or more sophisticated Java-based applications. Anyone can review drawings, construction photographs, meeting minutes, and change orders. They can exchange E-mail, create and print reports, and broadcast comments to the rest of the team. The centralized data source guarantees that everyone always has access to the most current versions of drawings and other information; the project control software enables drawings to be linked with any associated nongraphic documents.

Rothman, who manages FBA's extranet installations, explains the advantages over traditional design and construction communications. "The extranet allows us to provide our most up-to-date data to the entire team instantaneously. Their schedule doesn't have to coincide with ours, they're notified when anything is updated, and they can retrieve the new data whenever they want. We can put shortcuts on the Web site so they don't have to go beyond the opening screen. They just click on 'latest meeting report,' for example, and it opens automatically. Or, they can click on a thumbnail of a floor plan, and it expands to full size on their screen."

Already, the client for one project has required that a project extranet be the primary vehicle for communications. All team members are required to have Internet access, and that remains the only way that meeting notes, announcements, and files are distributed. Rothman reports: "Those using it have been very enthusiastic."

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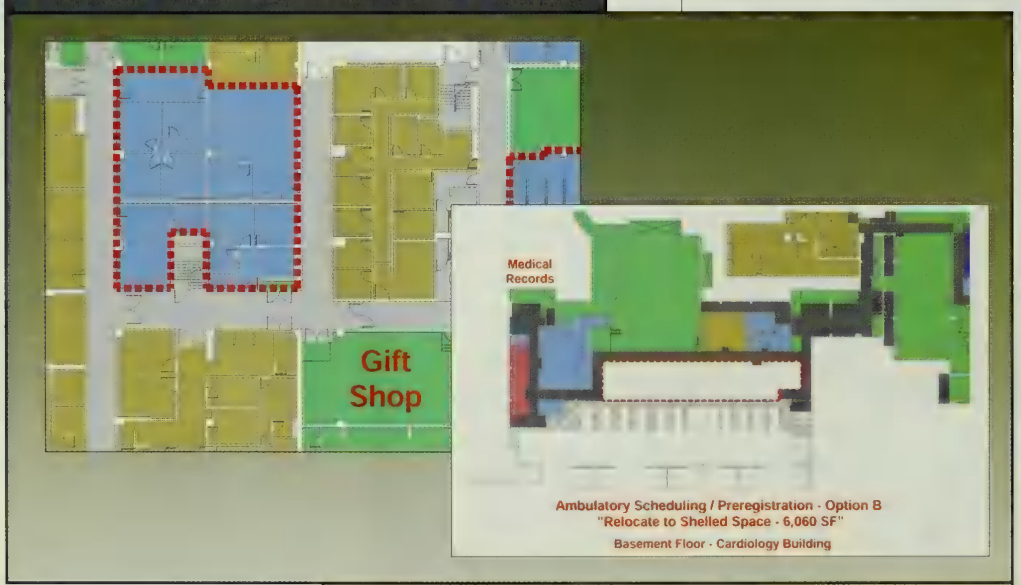
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DESIGNING NEW OPPORTUNITIES FOR ADDITIONAL SERVICES

BSA Design, of Indianapolis, has built a reputation for work on health-care, higher education, research, commercial, corporate, civic, and industrial projects. The award-winning, multidisciplinary firm offers planning, architectural, engineering, interior, and facilities management services.

Radical changes in the health-care industry over the past few years have opened up opportunities for firms willing and able to take the plunge into new client services. Hospitals have become more competitive, cost-conscious, and eager to take advantage of computer-aided facilities management (CAFM) systems to make their day-to-day operations more efficient. Benefiting from this trend has been BSA Design in Indianapolis and its recent spin-off, Continuum Solutions Consulting, which focuses on strategic planning and asset and facility management. One of the largest architecture/engineering firms in the Midwest, BSA specializes in the design of health-care and other high-tech facilities. Now Continuum Solutions has created its own service for those clients: the design of information systems.

PIECING TOGETHER THE CAFM PUZZLE



Continuum Solutions Consulting generated these images to display and evaluate several responses to space requests. The floor plan images become the interface to additional data.

Architect Mark Handy, director of asset and facility management for Continuum Solutions, has been using CAFM software from ARCHIBUS, Inc., for four years to integrate hospitals' CAD drawings and nongraphic data systems. His first project was to organize a comparative study for two hospitals that had just merged. He had to compile the CAD and data files for three million square feet and standardize the data according to Medicare norms. When the study was finished, Handy recognized the value his expertise could add to the development of the client's facilities standards.

Handy's methodology for this value-added service involves stripping the drawings of construction-related notes and symbols not related to building operations so they can be used in CAFM programs. Later, when the facility requires an addition or remodeling, those drawings are available as base information for the next project. "It's a logical extension of our design services," Handy says, "the ultimate information recycling." Combining their knowledge of architecture and information systems, Handy and his staff have set up CAFM systems for a number of hospital and medical facility owners. Because his clients compete with each other and may hire competing architects for design services, they do their own database management. But, Handy notes, because CAFM software evolves so rapidly, some clients return to him every year for the latest update.

As stand-alone software or used with AutoCAD, ARCHIBUS/FM helps a facility manager to understand and manage the company's real assets at every scale, from global real estate down to lightbulbs. Control over this information enables facility managers to oversee leases and personnel moves, assess how efficiently space is being used within a given department, determine the proper furnishings and equipment for various types of employees, monitor computer networks, schedule routine maintenance operations, and perform countless other functions.

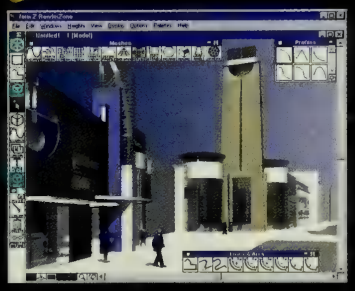
One challenge of CAFM systems has always been to make managing these huge and complex databases easy for nontechnical staff. And now that the World Wide Web has demonstrated how much can be discovered with a simple browser, clients are requesting simple methods to navigate their large databases.

A recent addition to ARCHIBUS/FM has made this ease-of-use possible. About a year ago, Handy explains, ARCHIBUS introduced the Executive Information Systems module, which enables technically savvy users to create a customized, Windows-like graphical interface that allows anyone to access and manipulate the information in the CAFM system. He compares this to custom-designing a dashboard according to the needs and abilities of the driver. (A consultant like Handy is still required to be expert in the detailed needs and procedures of the client.) Facilities managers who may use the computer system only occasionally can now access or create very sophisticated reports without needing to know all the intricacies of the software. And because ARCHIBUS/FM works with powerful Sybase or Oracle databases, the resulting information can be extremely complex, even if the interface is not.

Handy compares the effect of EIS to having tabs on a binder, "except that here the binder pages are interactive and dynamic." He explains, "We teach our clients things like the difference between a spatial hierarchy and an organizational one. Using a graphical interface, it becomes much easier to describe these relationships. Architects are used to describing relationships through functional and spatial diagrams, and now we can present the client's information in a graphical way as well. This turns it into an additional service." ■

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Images by **Steve Kelley** and **John Marx**, Senior Project Designers, Kaplan/McLaughlin/Diaz Architects, San Francisco, California.

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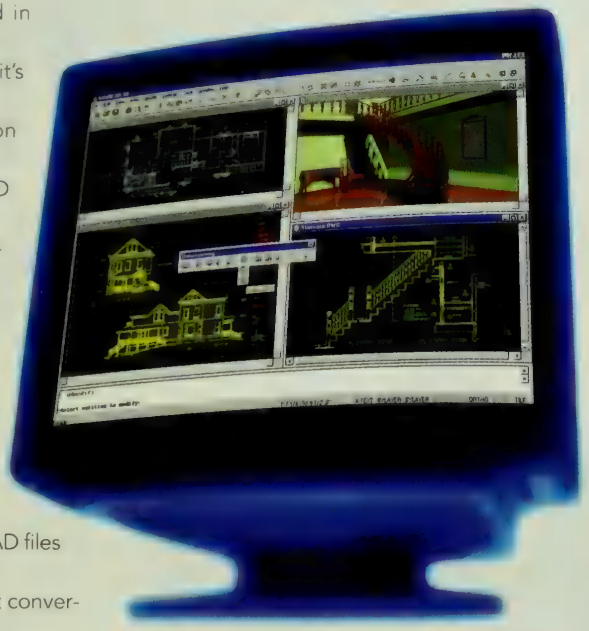
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What To Buy and How To Buy It

ASKING THE RIGHT QUESTIONS HELPS USERS SELECT HARDWARE AND PERIPHERALS THAT BALANCE NEEDS AGAINST COSTS AND CHANGES IN TECHNOLOGY.

by Steven S. Ross

Architects are at a disadvantage when shopping for computer equipment. Their computer needs are more specialized than those of most other professionals; performance minimums for architects' machines roughly correspond to the general consumer's maximums.

Product ratings in computer magazines often ignore or downplay the features most important to architects, such as fast 3D graphics and spacious hard drives. Hiring a technology consultant is expensive. The computer superstores are geared to the mass market and carry small monitors and pokey CPUs, and their salespeople understand computer games better than sophisticated graphics capabilities and memory capacity. Mail-order operations are based on volume, not customization. Shopping on the Web works only for those who know exactly what they need.

At the Mithun Partners, a 150-person architecture firm with a three-person management information systems (MIS) department, computer equipment is purchased from a local vendor who specializes in working with architects. Bryan Anthony, the MIS director, meets with members of a local AIA chapter to discuss technology developments. "It's essential that firms designate someone who can keep up [with the technology] by reading or casting around on the Web. That's the best way to get good advice," he says. He keeps informed by checking several CAD-related Web sites on a regular basis.

No affordable system can be all things to all users. Architects must balance the strengths and weaknesses of each technology against their needs. The following guide is intended to help architects make intelligent technology choices. Knowing the right questions to ask and understanding enough about the subject to navigate the sea of products available can make the difference between a system that will need to be upgraded in six months and one that will still be useful in two years.

WORKSTATIONS

Workstations are becoming less expensive, faster, more standardized, and easier to install, especially those running Windows NT. As a result, the major producers of business personal computers have marched into the engineering workstation market once dominated by Intergraph, Tri-Star, and local vendors. Compaq, Dell, Gateway, IBM, and Hewlett-Packard—all of whom sell equipment suitable for CAD and other architectural tasks—are active in this marketplace. A typical architect's workstation has 128MB of RAM, a 6GB SCSI (small computer system interface) hard drive, graphics cards with video acceleration and two-monitor capability, and a Pentium II CPU running at 300 MHz or faster.

How easy is it to install? Network cards, operating system software, graphics cards, and drivers should all be in place when the computer system is removed from its box.

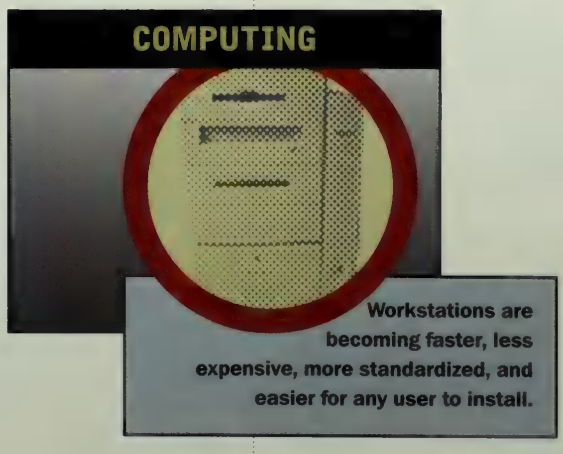
How well does it communicate with other devices in the office? Tell the vendor the type of network and cabling used in the office, as well as the specific supplier of network software.

What are service and leasing options? The major vendors offer a wide variety of service and leasing options. But local dealers should not be ignored; they often compete well on price and service. Expect to pay the latter extra in exchange for their familiarity with your system. Also consider a lease with a flexible termination clause in case your needs change or something newer and better appears.

How fast? These days, the price difference between fast and faster is so small that paying a little more for speed makes sense. A 330 MHz Pentium II CPU, for instance, is 3 to 5 percent faster than a 300 MHz. For those dealing with large drawings or lots of rendering and animation, the additional investment is worthwhile.

There are ways to lower cost without sacrificing too much speed. For workstations that won't be handling 3D graphics, "clone CPUs" from vendors such as AMD and Cyrix/IBM are perfectly adequate and will save $300 or so per machine. Consider substituting an EIDE (extended integrated device electronics) hard drive for the faster, more expensive SCSI drives. The difference shows up only in animation and rendering work. EIDE is also easier to configure and maintain because all its circuitry is in the drive itself. By comparison, SCSI drives must be mated to controllers, and there are so many combinations of systems, drives, and controllers that configuring them can be tedious.

On the Macintosh side, Apple's G3 series offers a major improvement in speed over older Macs. Look for models that have room for extra drives and memory.



Workstations are becoming faster, less expensive, more standardized, and easier for any user to install.

STORAGE

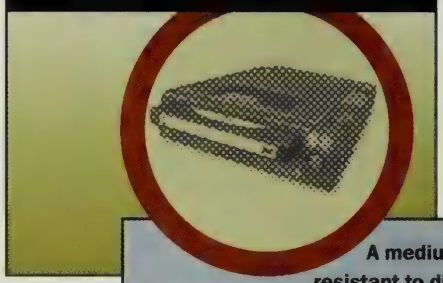
There are a lot of options for those who need more removable storage capacity than a floppy can provide. Emerging technologies include Sony's 200MB floppy-compatible system and Iomega's 40MB miniature Click disk. Most cartridges, however, must be used in specific drives; there's no widely used standard.

What are the disk and drive compatible with? For those who must move files around from office to office, or share them with consultants and clients, it's essential that other equipment can handle your disks. The most compatible high-capacity media today, and the disk types used by more people than any other, are the Iomega Zip disk and CD-R (writable CD-ROM) disks that can be played on any CD-ROM drives. Heeding filename conventions (i.e., sticking to the DOS eight-character limit) means that CD-R disks can be read on a Mac or on a PC. CD-R disks can't be erased. But one can be written to up to 99 times in "multisession mode," until it runs out of space.

How fast is it? Animation demands systems that can load a file quickly from the disk. CD-R has the speed advantage, but various SyQuest drives and the Iomega Jaz are usually fast enough to get the job done, and are faster than many CD-ROM drives.

Which is most reliable? Architects often must transport drawing files into the field. Thus, a medium that is resistant to dirt, moisture, and falls is a plus. All of the choices are fairly robust, though CD-R has the edge. All can be damaged by being left in a hot car or exposed to strong sunlight for an hour or two. Zip disks will usually survive a fall of four feet or more. Jaz and Syquest cartridges take some hard knocks but aren't as reliable. Among magnetic media, nothing beats the LS-120 Superdisk format. Each holds 120MB, is about as reliable as a floppy disk, and will survive a fall of six feet onto a hard floor. But the LS-120 is not fast enough to play animations directly; files must be moved to a hard drive first.

REMOVABLE MEDIA



A medium that is resistant to dirt, moisture, and falls is a plus for architects doing computer work in the field.

TECHNOLOGY	CAPACITY	SPEED	RELIABILITY	COST	NOTES
CD-R	650MB; SPECIAL DISKS CAN STORE 700MB	FAST ENOUGH FOR MULTIMEDIA, THOUGH A FULL DISK CAN TAKE MORE THAN AN HOUR TO CREATE	EXTREMELY RUGGED	DRIVES THAT WRITE THESE DISKS TYPICALLY COST $300 TO $500. DISKS ARE ABOUT $1 TO $3 EACH.	READABLE ON ANY CD-ROM DRIVE AND ON NEWER DVD DRIVES
CD-RW	650MB	ABOUT THE SAME AS CD-R; FILLING A DISK TAKES LESS TIME THAN FOR CD-R	EXTREMELY RUGGED	NOT ALL CD-R DRIVES CAN CREATE A CD-RW DISK; THAT CAPABILITY COSTS ABOUT $100 EXTRA. DISKS COST $12 TO $15.	CD-RW DISKS CAN BE WRITTEN TO AND ERASED MANY TIMES. READABLE ON ANY CD-ROM DRIVE.
DVR-R	4GB	FASTER THAN ANY OTHER MEDIUM; CAPABLE OF RECORDING HIGH-QUALITY, FULL-SCREEN VIDEO	EXTREMELY RUGGED; MORE RESISTANT TO SUNLIGHT AND WARPING THAN OTHER DISKS	EXPECT TO PAY BETWEEN $500 AND $700.	OLDER DVD-R DRIVES MAY NOT BE ABLE TO READ CD-R DISKS BUT CAN READ CD-RW.
IOMEGA ZIP	100MB	SLOW, EVEN WHEN THE CONNECTION IS THROUGH AN EIDE OR SCSI INTERFACE	WILL SURVIVE MOST FALLS, BUT NOT AS TOUGH AS OTHER DISKS	DRIVES ARE $75 (FOR OLDER PARALLEL-PORT MODELS) TO $300 (FOR UNITS THAT FIT INTO LAPTOPS). DISKS COST $10 TO $12.	MACs CAN READ A PC-FORMATTED ZIP DISK. BUT PCs CAN READ A MAC-FORMATTED DISK ONLY WITH ADD-ON SOFTWARE.
IOMEGA JAZ	1GB OR 2GB	FAST ENOUGH FOR ALMOST ALL MULTIMEDIA PURPOSES	MORE DELICATE THAN ZIP DISK	ABOUT $300 FOR 1GB VERSION; AN ADDITIONAL $200 FOR 2GB. CARTRIDGES RUN ABOUT $100/GB.	THE MAC-TO-PC RULES ARE THE SAME AS FOR ZIP DISKS.
SYQUEST SYJET AND SPARQ	1GB OR 1.5GB	FAST ENOUGH FOR ALMOST ALL MULTIMEDIA PURPOSES	MORE DELICATE THAN ZIP DISK	ABOUT $200 FOR 1GB SparQ 1.0; CARTRIDGES RUN ABOUT $33. ABOUT $250 FOR SyJet 1.5GB; CARTRIDGES RUN $80.	FOR PCs ONLY
SYQUEST EZFLYER	135MB OR 270MB	FASTER THAN ZIP DISK	ABOUT THE SAME AS ZIP DISK	ABOUT $150 FOR DRIVE. 135MB CARTRIDGES ARE $25; 230MB CARTRIDGES ARE ABOUT $33.	FOR PCs ONLY
SUPERDISK	120MB	SLOW, ABOUT FIVE TIMES FASTER THAN A FLOPPY	EMELY RUGGED	DRIVES ARE UNDER $100 WITH REBATES; CARTRIDGES ARE $15.	DRIVES ALSO READ 1.44MB AND 720K FLOPPIES.

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DIGITAL CAMERAS

Digital cameras are a quick way to capture scenes into which CAD-generated project images can be inserted. They can also capture textures, images of people, street furniture, and other items that make drawings fuller, more useful, and more realistic. With special software, it's possible to use these digital images to generate realistic 3D CAD files.

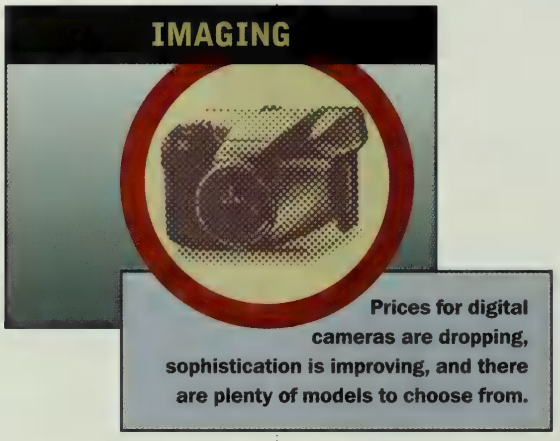
Prices for digital cameras are coming down and their technical sophistication is going up. But to make things confusing, plenty of vendors have jumped into the market with dozens of new products. All of the major camera and film vendors are offering digital cameras, as are most of the major electronics firms—Kodak, Fuji, Olympus, Sony, Pentax, Agfa, Casio, Epson, Canon, Ricoh, Toshiba, Yashica, Sharp, Konica, Minolta, Hewlett-Packard, Nikon, and Panasonic among them.

How many pixels? The resolution of an image is measured in pixels, or dots; more pixels means better resolution. Also, more pixels allow the user to crop a small section of the overall image and still have sufficient resolution to make that excerpt usable. Until recently the norm was 640 by 480 pixels; today it's 1024 by 768 and increasing. Higher resolutions at lower prices are appearing monthly.

What is the image format? Most cameras aimed at the amateur market save their images in a compressed format called JPEG. This is fine for on-screen use, but JPEG images don't look as good when printed. High-contrast lines on a slant tend to develop jagged edges, for example. JPEG technology is improving, but to gain higher image quality, try the Kodak DC camera series.

How much memory? For those planning to take multiple digital photos, start with at least 4MB of memory in the camera, which allows for storage of about 20 images. The Sony Mavica is unusual in that it uses floppy disks to store images. The resolution is at the low end (640 by 480 pixels), but the convenience can't be beat.

Memory is accessed in two ways. In the SmartMedia format, most of the software needed for the interface between memory card and camera (or between card and computer) is on the card itself. The other is the CompactFlash format, where the computer treats the camera as a small hard drive. CompactFlash cards are less expensive and generally more compatible with other equipment, such as palmtop computers. They are also available with larger amounts of memory.



Prices for digital cameras are dropping, sophistication is improving, and there are plenty of models to choose from.

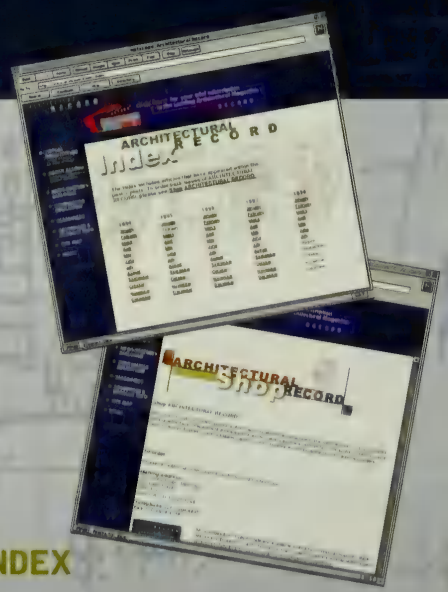
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MONITORS

The mass market for monitors is catching up to professional levels and bringing prices down. Good 17-inch units are available for under $400. The typical CAD workstation's 21-inch monitor is still pricey, but the 19-inch size is a nice, cheaper alternative. Several vendors, including ViewSonic and Panasonic, have come out with "short length" models—shallow monitors that take up less space on the desktop. Monitor terminology is confusing, though, and there is more to a monitor spec than size.

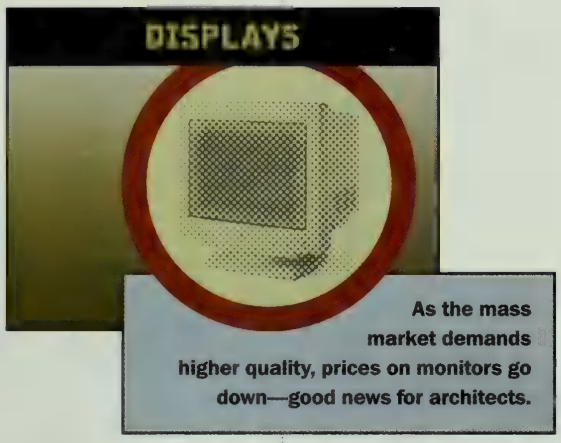
What type is it? Monitors come in two major types, with several sub-varieties. The most common is the dot- or shadow-mask, in which three beams of electrons excite red, green, and blue phosphors. The second major type is the aperture grille, or stripe-mask, which channels the electron beam to thin phosphor stripes on the tube's inner face. Monitors marked "Trinitron" or "Diamondtron" use this method. They are brighter than shadow-mask screens, making them a good choice for architects. But the thin vertical wires can show up as vertical dark lines. Where ambient lighting is ample, stripe-mask monitors are easiest on the eyes.

What is dot pitch? This is the resolution of the screen—the level at which it shows detail. On a dot-mask monitor, it is the distance between dots of the same color. On a Trinitron, it is the horizontal distance between stripes of the same color. Look for a dot pitch of .26 to .28; smaller is better.

What is the refresh rate? This is the frequency at which the screen is redrawn by the electron beams. The lower the refresh rate, the worse the "flicker." The rate considered acceptable keeps going up. The Video Electronics Standards Association recommends at least 85 Hz for monitors larger than 17 inches. Smaller monitors look good to most people at 75 Hz. The refresh rate varies with resolution, so make sure that the quoted rate is at the appropriate resolution. For those sensitive to flicker, reducing the screen resolution helps.

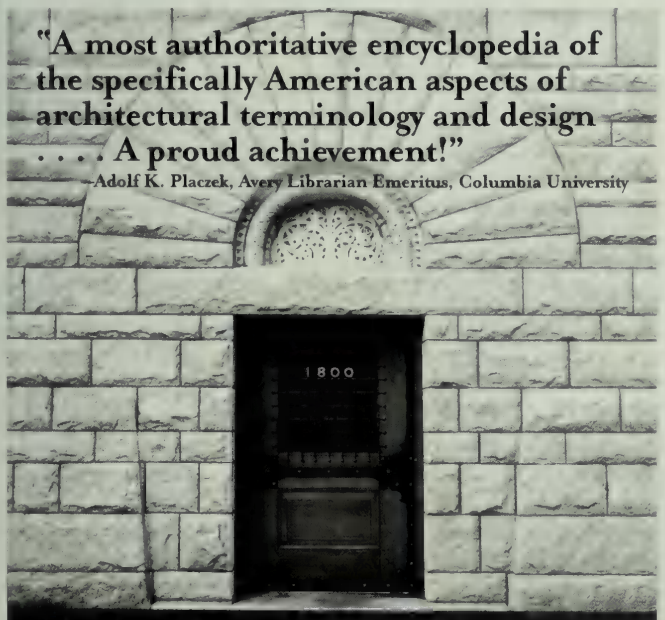
What is USB? The Universal Serial Bus is a new, self-configuring interface that makes moving machines around easy. Look for monitors with USB hubs built in, which makes hooking up USB peripherals for scanning and printing easy.

What about LCD panels? These flat screens take up little space and don't flicker. They are still expensive and don't have enough contrast for precision CAD use. But they're getting cheaper and should be commonplace in a few years.



As the mass market demands higher quality, prices on monitors go down—good news for architects.

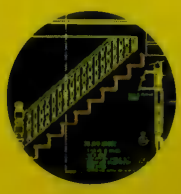
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MODEMS

A modem, strictly speaking, is a device that turns the digital zeros and ones of a computer file into tones the telephone system understands. At the receiving end, the modem turns the tones back into zeros and ones. Modems are a commodity item. In part, that's because there are only a few vendors making the chips that all modem vendors use, and the chips must conform to international technology standards. The two big chip vendors are Rockwell (which has most of the market) and AT&T. Major modem vendors include U.S. Robotics and its merger partner 3Com, and Hayes.

Is it compatible with cell phones and other equipment? The term "modem" has also come to refer to devices that hook computers into ISDN lines, cell phones, or cable TV systems. ISDN and cable are digital—no conversion to tones ever takes place. Increasingly, cell phones are digital as well. Thus, modem equipment must match the requirements of the equipment in an office or home.

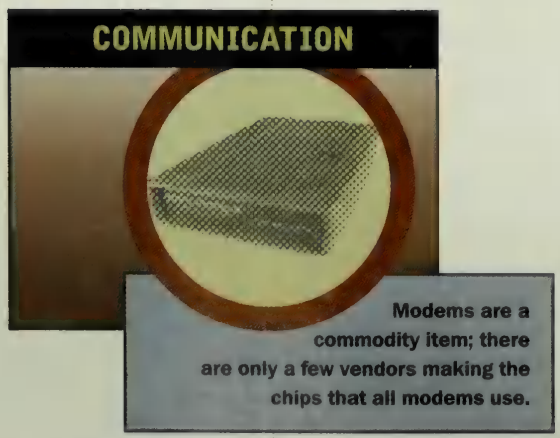
For those planning to use a modem with a cell phone, it helps if the modem is designed specifically for that. But older modems may work fine as long as the cell phone is an older model and the user stays within range of the same cell antenna while transferring data. Newer digital phones demand special modems. Be sure to test any new and fancy equipment at hand before buying.

How fast is it? As far as throughput is concerned, there is little difference right now between 33.6 kbs (kilobits per second) modems and 56 kbs (which generally run at 53 kbs). It's worth buying an older 33.6 model, which are now very cheap. For those who already have 33.6 or even 28.8: Don't bother upgrading unless you have heavy-duty file-transfer needs (continuously sending large plotter files to a reproduction house, for instance).

For laptops, which often have to function on networks and over phone lines, consider PCMCIA cards that combine Ethernet with the modem. Older cards may be fine and will save the cost of upgrading.

For those considering the purchase of a Palm PC or other tiny Windows CE (compact edition) machine, look for models that use a "software modem," run by the computer's own processor, rather than a separate modem. The performance is the same, but the software doesn't eat batteries.

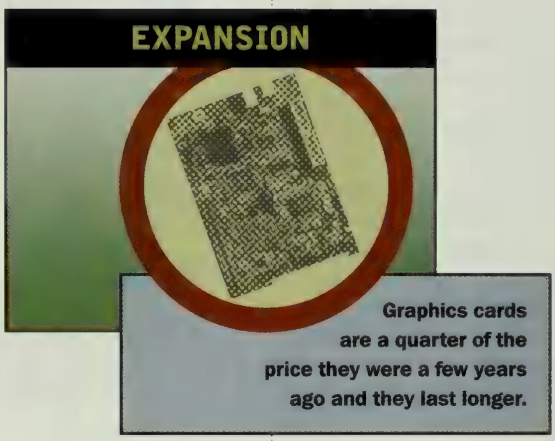
Is there other hardware that makes connections faster? ISDN lines, which typically run at 64 or 128 kbs, can be connected to the computer with a special box that takes the place of a modem. Internal networks can be connected to ISDN or conventional phone lines.



GRAPHICS CARDS

Graphics cards that cost $2,000 a few years ago can now be had for $500 or less. Drivers, the software that allows the cards to work with a particular computer or program, have become standardized. As a result, cards aren't rendered useless within a few years. However, users are now demanding more screen resolution, more colors, and more animation than ever before. Now 8MB of video RAM (VRAM) is an absolute minimum.

Graphics cards that can handle the three major 3D graphics standards—OpenGL, Direct3D, and HEIDI—have become less expensive. That's due in part to better HEIDI interfaces from AutoCAD, new graphics chips from several suppliers, and seamless support for OpenGL in Windows NT 4.0.



OTHER INPUT DEVICES

There are several new ways to get information into the computer. Some make the drafting task easier, while others allow users to capture data in the field and upload it in the office.

New controllers let the user's hands work in 3D while on a 2D surface. Some are pucklike mouses that are combined with a trackball or joystick for rotational motion. Most controllers are connected to the computer through the serial port or the port labeled "ps/2." Macintosh input devices are connected through the Apple desktop port. Make sure the controller is compatible; most PC-based equipment will not work with Apple systems.

Input devices should be matched to the functions they're intended to perform. Too often the controller is very fancy, but the tasks it is meant to perform are very simple. Also, they can eat up a lot of desk space.

Handheld microphones and speaker systems are aimed at the traveler and at the voice-recognition market. Pick up a sound card, about $100, at any local computer store. Since sound quality is the major consideration, be sure to test it with your voice in a noisy environment.

Casio, Hewlett-Packard, Philips, Sharp, Everex, Geobook (which has a keyboard that's almost laptop-size), and Psion offer palmtop computers that challenge the Palm Pilot series from 3Com. Test these carefully before you buy, since some are hard to use. Not all of these interface with a Mac. Also, some go through batteries very quickly and are sensitive to heat and water. Make sure the dealer and the software vendors offer a service contract.

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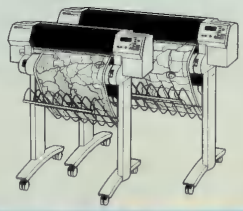
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PRINTERS, PLOTTERS, SCANNERS

The terms "plotter" and "large-format printer" are becoming interchangeable. Lower pricing and ease in set-up mean smaller firms can have large-format printer/plotter functions in-house. Also, the transition from pen plotter to inkjet is nearly complete, with models available from Hewlett-Packard, EnCAD, and others. Inkjets are more reliable and easier to service, and they create clearer documents.

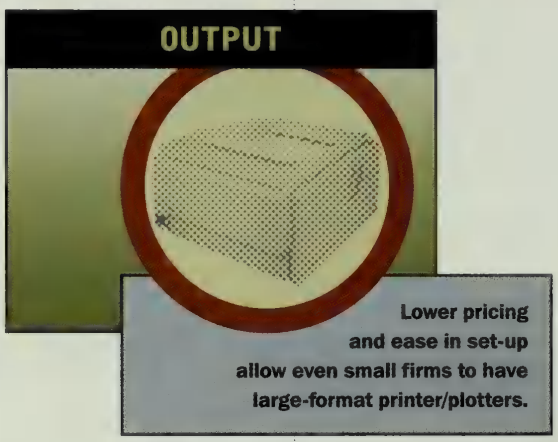
Is it network-ready? It used to be that if you wanted to connect the plotter to a network, there were few choices, due to limitations in software. Now plotter management software, which controls how the image gets from the computer to the printer, almost always comes with the unit and is compatible with most systems. Occasionally the software must be adjusted when used with an older network. As a result of these software advances, there is now a large number of network-ready products available from companies such as CADNET.

Digital or analog? Digital plotters have replaced analog machines in the medium- and high-price, high-speed ranges. Digital plotting offers higher quality than analog and makes the link from the plotter to the network easier. The vector-to-raster processing (from the CAD file's vectors to the printed image's raster) can take place in the workstation rather than in the plotter. As a result, there is less of a strain on the network; printing does not slow or halt other computer functions.

How easy is it to maintain? Disassembling a pen plotter used to be like performing surgery. The new inkjet systems are almost all modular. Simply visit a local supplier for ink, print head, or other components that can be plugged in.

What is the capacity? Most offices have high peak printing needs followed by long periods of inactivity. Consider sending peak jobs to repro houses, rather than installing hardware to handle the peaks.

What about scanners? Higher resolution means more detail, but it also means slower printing and higher costs. A very inexpensive system, perhaps $80, is useful for simple scans, while more complex jobs can be sent out. As a rule, scanners that connect through the parallel port are slower than those connected through a SCSI interface—important to know if there is a high volume of production work.



SEARCHING FOR SOFTWARE: SEE THE CAD SELECTION TABLES AT WWW.ARCHRECORD.COM

Deciding which CAD system is best for your firm is a complex task. Where can an architect turn for guidance?

While most architects realize that CAD software is more than an electronic pencil, few realize its full power, and fewer know how to harness it. CAD manufacturers are taking advantage of the growing power of desktop computers to create systems that offer flexibility, easy-to-use interfaces, and networkability. Software packages are also becoming more powerful, as well as incorporating new ways to link to other software. And as all the software and all the links become more standard, more interchangeable, CAD is no longer a tool; it is a system.

A comprehensive CAD system would include tools for making drawings; creating models; conceptualizing and designing; analyzing designs for cost and energy consumption; visualizing and communicating designs and models to clients, colleagues, and builders; physically manufacturing real objects; and linking to project planning, financial, and product data. An architect's office needs all of these tools, although the mix varies.

No single CAD product offers all of these tools, though some high-end systems do deliver them in one way or another, typically with add-ons. The add-on vendors, for their part, keep pushing the limits, creating new productivity tools and new links to existing tools that are often developed outside the world of CAD—animation and financial packages, for instance. Architecture firms might also rely on their own bright systems people to integrate these functions for them. And the low-end CAD vendors, the ones who concentrate on drafting tools, try to make their products as compatible as possible with the high-end products.

Under the hood, CAD packages are really databases with graphical interfaces that allow the user to add entries to a large database. Each element in a drawing is just a data record; the drawing is a well-organized collection of these records. Aside from this data management system, the supporting framework includes an operating environment and ways to handle external functions, such as network connections and links to other data.

While these elements are important, it is the operating system that provides an interface between software and hardware. Today's operating systems are robust enough for firms to link files that are running on machines with varying operating systems. The Mac, for instance, can run Windows or Unix. It's usually easier to transfer work between operating systems than to move from one CAD system to another.

This month, ARCHITECTURAL RECORD's Web site introduces tables with specifications on almost 25 CAD systems. Excerpted from *The CAD Rating Guide: A Tool for the Evaluation of Computer-Aided Design Systems Including FEM, GIS, and Animation Systems* (ZEM Press, $150), a 650-page book by W. Bradley Holtz, the tables show what platforms support the various packages, where to get technical support, which tasks the systems perform, and what some of their selected advanced functions are. Visit www.archrecord.com for more information.



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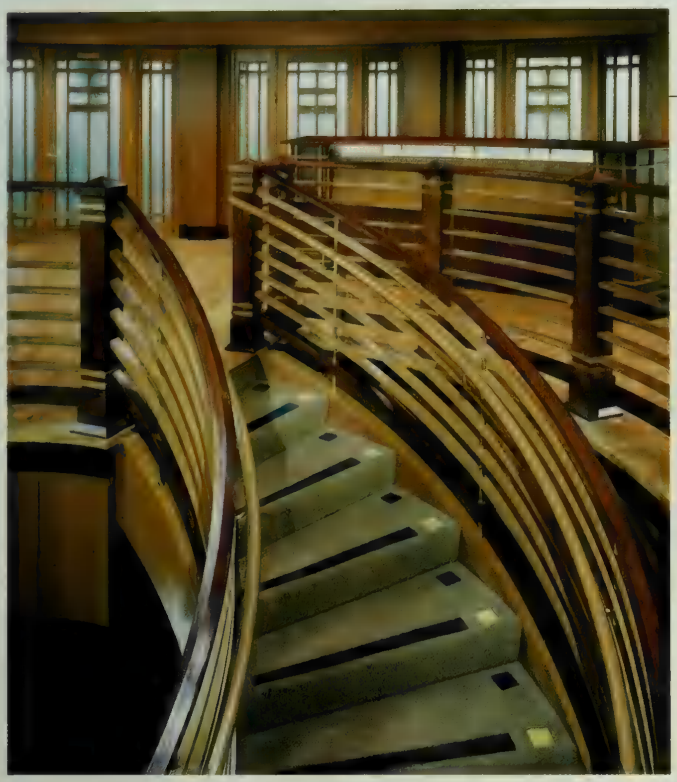
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Safer, More Attractive Staircases

WHILE FEW ELEMENTS OF A BUILDING ARE MORE DANGEROUS, STAIRS CAN BE MADE BEAUTIFUL AND LESS HAZARDOUS WITH GOOD DESIGN AND THE CREATIVE USE OF MATERIALS.



The stairs at the American Forest and Paper Association, designed by Greenwell Goetz Architects, lead from the reception area to offices below.

by David Hill

Stairs, often one of the defining elements of a building, can turn an otherwise ordinary space into something sublime. It's hard to imagine the Capitol without the steps overlooking the Mall, or the Paris Opera without its staircase. Stairs must be functional. Those at the Loretto Chapel are little more than a glorified ladder allowing access to the choir loft. But a staircase must do more than satisfy circulation needs; it must also satisfy the eyes and, perhaps above all else, it must be safe.

In Santa Fe, New Mexico, there is a small chapel built in the 1870s by the Sisters of Loretto. Modeled after Sainte-Chapelle in Paris, the chapel was designed by a French architect named P. Mouly. Before the chapel could be completed, Mouly was killed by John Lamy, the bishop's nephew, who accused the architect of seducing his wife. Mouly had designed a beautiful choir loft high above the chapel floor. Unfortunately, the construction crew could not figure out how the architect had intended to reach the loft, as there was little room for conventional stairs. Distressed, the sisters sought guidance from a higher power: Saint Joseph, the patron saint of carpenters.

Their prayers were answered when a nameless old carpenter appeared one day and volunteered to build the stairs. He worked alone, and when he was finished, he had created a masterpiece of engineering and design, a spiral staircase that still inspires awe in visitors to the chapel. The staircase is 22 feet high, with 33 steps and no central or side supports. It makes two complete 360-degree turns and is held together with wooden pegs instead of nails. The sisters declared the stairs "miraculous," but before the carpenter could be thanked or paid, he disappeared.

David Hill is a Denver-based freelance writer who specializes in education and architecture-related subjects.

Stair safety

Stairs are among the most hazardous areas in a building. According to the National Center for Health Statistics, every year in the United States more than 1,000 people die from falls on staircases. While most of these accidents are in the home, those that occur in commercial buildings usually take place at the top and bottom of the stairs, where there are abrupt changes in level and surface materials. People may fall because of inadequate lighting; obstructions on the stairs, such as nosings that project beyond the step; distracting views; slippery treads; and confusing patterns on treads and risers. They also fall because they're crowded by other people or because they're in a hurry and aren't cautious. Statistics show that serious falls during descent outnumber those in ascent, and that the instrument of injury in most cases is the steps themselves, especially those with concrete, wood, or steel surfaces. Carpeted steps are more slippery, but they are less likely to cause serious harm to an individual who falls.

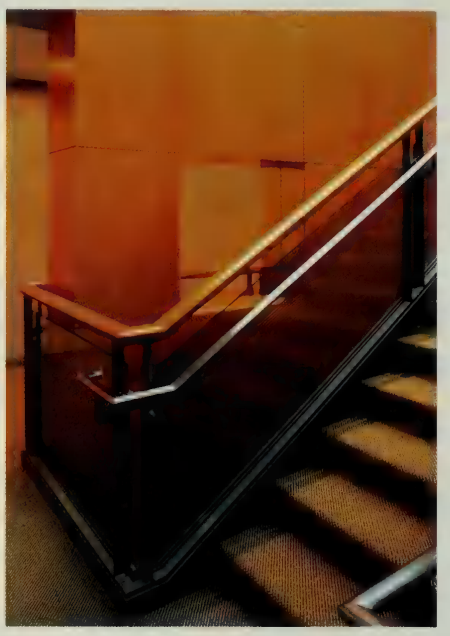
Despite these disturbing statistics, there's no doubt that the stairs being built today are safer than ever. That's partly because building codes that govern how commercial stairs are built, particularly the Americans with Disabilities Act (ADA), have become more stringent within the past 10 to 15 years. "Stairs are one of the most codified elements of a building," says Michael Brush, AIA, senior designer at Kahler Slater Architects, Inc. "The challenge is working within these limits and making the stairs attractive and affordable."

Continuing Education *Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 214 and follow the instructions.*

Learning Objectives *After reading this article, you should be able to:*

1. *Identify safety concerns for stairways.*
2. *Describe the elements of a stairway specified by code.*
3. *Discuss the parameters for designing the rise-to-run proportion of a stairway.*
4. *List ways in which stairways can be designed to be more aesthetically pleasing.*
5. *Discuss the relationship between stairs and elevators in a building.*





When the United States Court of Appeals in San Francisco was upgraded by Skidmore, Owings & Merrill, a grand stair (left) was added to make the library and atrium livelier. Windows in the adjacent wall (above) frame views of the stair and the space beyond. The maple guardrail matches the paneling.

It is up to architects to meet or even exceed building codes while designing stairs that meet a building's aesthetic requirements. That's not easy. "You definitely lose some drama because of codes," Brush says. For example, it's hard to achieve an open look when codes require that handrails be continuous along both sides of the stair or that balusters be spaced close enough to prevent a child from falling through or being injured—usually no more than four inches apart. But Brush also realizes the codes' efficacy. "When you recognize why things are done a certain way—that limiting the size of the nosing makes it easier for someone who is weak or disabled to pull their foot onto the next step—you realize that the code is carefully thought out and not excessive," he adds.

Commercial stairs must comply with sometimes stringent local codes as well as the national building codes, the Life Safety Code (developed by the National Fire Protection Association), and the ADA, which specifies everything from the shape, height, and diameter of the railing to the configuration of the nosing and the location of the landings. Working within these restrictions, architects have various rules they follow to ascertain stair dimensions.

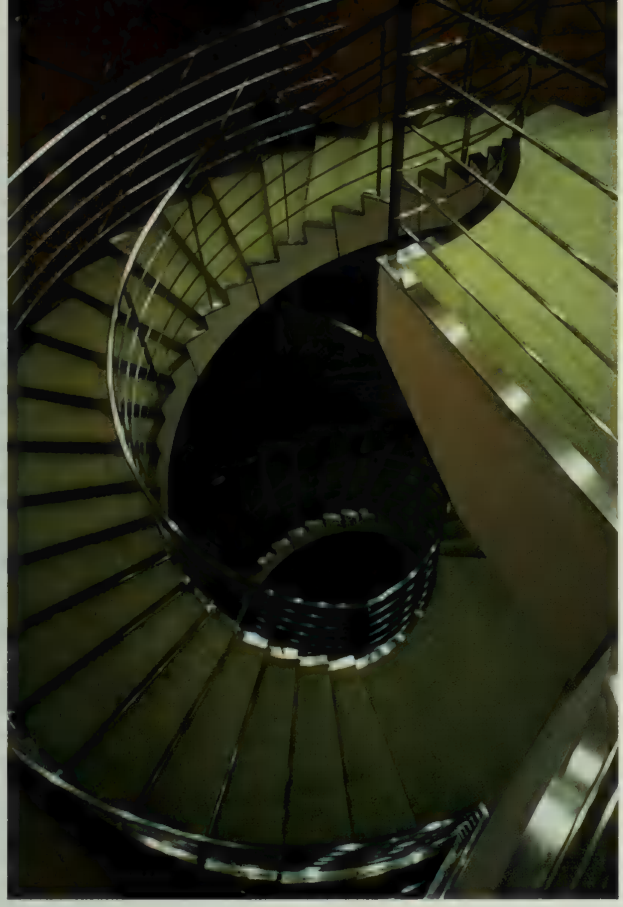
Stairs take up a great deal of square footage in a building. A steeper slope is more space-efficient, but it makes the stairs harder to climb. Research shows that the ideal slope, one that makes the stairway easy to climb at an average speed, is between 20 and 27 degrees. But rise-and-run proportions also depend on what the stairs will be used for and where they are located. Risers generally range from four to seven inches, while treads are between 11 and 14 inches. Brush uses a formula that says the depth of the tread plus twice the height of the riser should total 24 to 25 inches, or $2R + T = 24$ to 25.

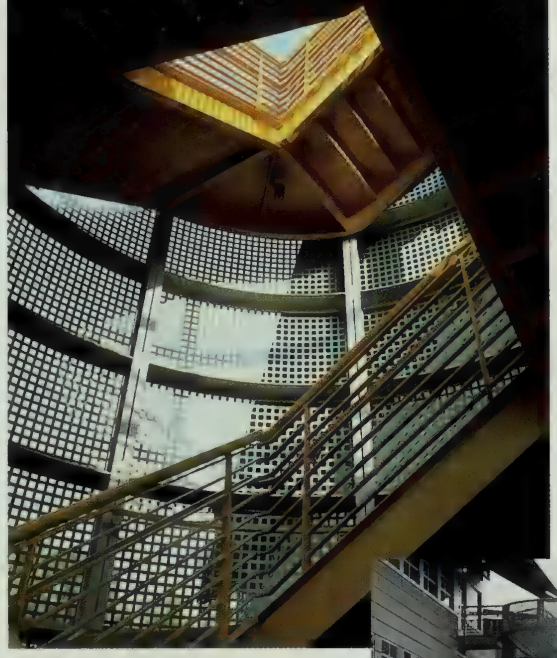
Denver architect Michael Brendle, FAIA, likes to design stairs with six-inch treads and 12-inch risers, proportions he calls "luxurious." Seven-inch risers combined with 11-inch treads "seem more quickly paced," he says. Shallower stairs can be extended with a nosing, though code requires that this be no more than 1½ inches long and be rounded. The width of the stair is based on the occupancy load, but a minimum of 48 inches is required by code. A wider stair provides more room for climbers to pause and socialize or simply catch their breath.

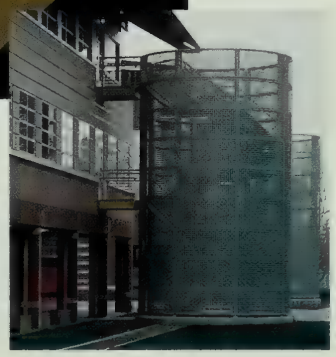
Handrails are one of the most important components of a stair and the codes that regulate their design leave architects little freedom. They dictate the few acceptable shapes and the size of the rail. The ADA requires a simple round profile that "permits some locking action by fingers as they curl around the handrail so they can be grasped firmly with a comfortable grip, and so the hand can be slid along the rail without encountering obstructions." There is some choice in materials, however. Many architects like the smoothness of steel, while others prefer the warmth of wood.

Codes are often exceeded when architects make stairs that are grand. But even on stairways that are merely utilitarian, architects often put in more frequent landings than those called for in the code. "There are rules about how many treads you can have between landings, but in a building used by children or elderly persons, for example, it's better to have more landings," Brush says. National codes require that a flight of stairs with a rise of more than 12 feet must have a landing, which must be as wide as the stairs. Where these landings are placed is often a question of traffic flow—whether the architect wants the stairs to funnel traffic at the top or bottom. Numerous landings can also keep stairs compact, wrapping them around a tower or interior wall, for example.

Lighting levels, though not mandated by code except for emer-







The stair at NTT Shinjuku Head Office Building (left), and the stair tower at Owens Corning World Headquarters (above and right), both by Cesar Pelli & Associates.

gency conditions, can contribute a great deal to the safety of a stairway. "It's hard to integrate lighting on a stair because the relationship to the ceiling changes with each step," Brush says. Shadows are also a problem: it's best if lighting levels are even throughout the staircase. Hanging lights help bring the light source closer to the stair. Putting the lighting on the walls is another solution, as is integrating the lights into the railing. Lighting along the treads calls a lot of attention to the stairs, though it is a valid approach.

While the positions of stairs and elevators need not be related, many architects try to put these elements in close proximity. Doing so makes it easier to find the stairs in case of an emergency. It also makes the stairs more convenient for quick trips when the elevator is slow.

Improving stairwells

Every multistory building must have at least one staircase, depending on the capacity of the building and the size of that staircase, that is designed to serve as a means of egress in the event of a fire, according to the Life Safety Code. Devoting a full 20 pages to making these areas safe, the code requires that these stairs serve as a safe haven for up to two hours, be made of noncombustible materials, provide minimum emergency lighting levels, and be sealed off from the rest of the building with fire-rated walls and doors. Sometimes such stairs are placed on the outside of a structure, but more typically they are enclosed in stairwells.

Cold and forbidding in appearance, these stairs are seldom inviting and generally are unused, wasting building space. However, introducing natural light, providing views of the outside with windows, and integrating the stairs and the building make stairwells safer, more social places without sacrificing safety. Making the treads and the risers different colors not only helps users differentiate the two, it also creates a livelier set of stairs. Most code officials advise against introducing vivid patterns, however, since these can be distracting.

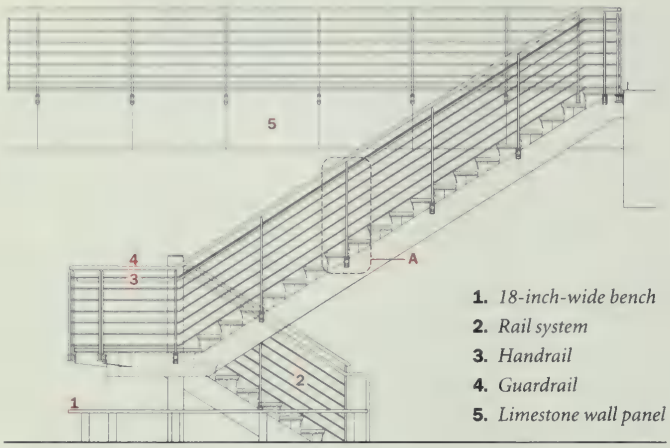
The central staircase at Little Village Academy, an elementary school in Chicago, is actually a stairwell that conforms to that city's tough fire regulations. But Ross Barney + Jankowski Inc.'s light-filled, wedge-shaped tower design has become a neighborhood landmark. "We wanted to give the school a heart, something distinctive," says Carol Ross Barney, FAIA. Located next to the school's main entrance, the three-story stair curves, forming half circles between floors. But when it comes to schools, code officials don't mess around. Although it poses no safety compromises, the unusual configuration meant some haggling with officials accustomed to straight stairs in fire towers. The concrete stairs, topped

ARCHITECTS ARE TRYING TO MAKE STAIRWELLS MORE INVITING SPACES.

with grit to prevent slipping, have landings positioned at eleven-step intervals. The architects were concerned about children tumbling and having nothing to break their fall.

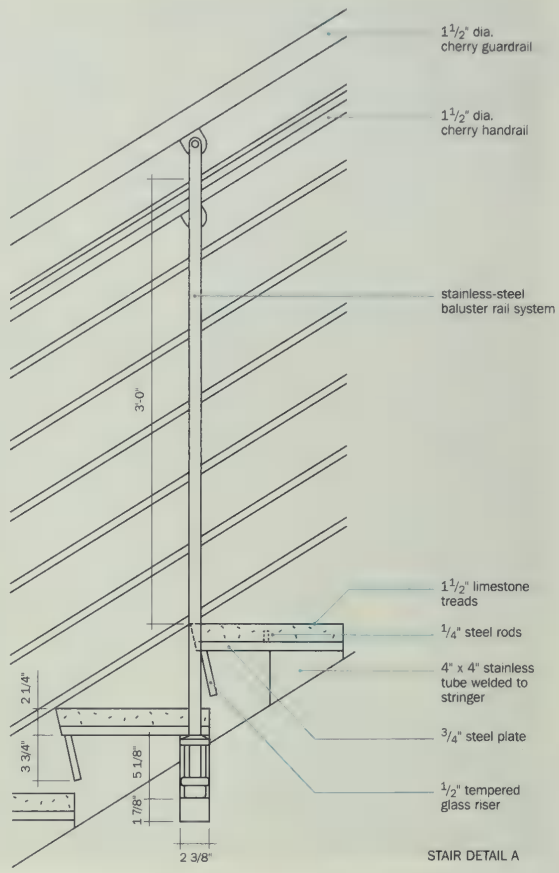
The steel handrails which, according to the Life Safety Code, "serve as a guide if smoke enters the stairway in a quantity to obscure one's vision or if the stair-lighting system fails," are mounted 34 inches above the stair nosing—at the low end of the code-required range of 34 to 38 inches to accommodate youngsters. The seven-inch risers and 11-inch treads are at code limits.

The staircase is supported, in part, by six-inch-diameter pipes that are tied to the stringers and to beams that extend from the outside



1. *18-inch-wide bench*
2. *Rail system*
3. *Handrail*
4. *Guardrail*
5. *Limestone wall panel*

NORTH-SOUTH STAIR SECTION



STAIR DETAIL A

Glass risers, honed limestone treads, and a stainless-steel railing system combine to make this stairway in Harnischfeger Industries' headquarters unique. The wood bench beneath the landing is a cane detection device.



wall. The pipes are topped with fluorescent light fixtures. At the top of the tower is an angled skylight with a sundial—an allusion to the role of the sun in Aztec culture, Ross Barney says.

Another viable alternative to the forbidding internal stairwell is an outside staircase. Bert Gregory, AIA, of the Mithun Partners, wanted to avoid using a conventional stairwell for the Seattle headquarters and flagship store of the Seattle-based outdoor-gear retailer Recreational Equipment, Inc. (REI). To do so, he created an open-air stair tower protected from the elements by a metal roof. The stairs are a primary means of egress, which means they conform to the same standards as an interior stair. Shoppers enter the tower from the parking garage or directly off the street and climb to the front door. From the sub-basement level of the parking lot, that's 32 feet, or four flights, of stairs. But visitors to REI tend to be young and athletic, the kind of people who prefer stairs to elevators.

Sometimes, making a stairwell inviting means working with code officials to find a solution. For his redesign of Denver's Ross–University Hills Library, Michael Brendle wanted to place one of two mandatory fire stairs in a vestibule that also serves as the main entrance. "We try to have some kind of 'grand stairway' in all our buildings," he says. The local fire code, however, required two sets of fully enclosed fire stairs. So Brendle added fire sprinklers to the building, which allowed him to keep the entrance stairs and still comply with the code.

Stairs that make a statement

It was once thought that elevators would effectively eliminate staircases, but that didn't exactly happen. What did happen, particularly in low-rise buildings, is that stairs became "the route of last resort," says John Templer, author of a two-volume study called *The Staircase* (MIT Press, 1992). Too often, he says, stairs are treated as a necessary nuisance and built with low levels of comfort, convenience, and ambience.

"It's a shame, because stairs are a significant design opportunity," Brendle says. Deep treads, shallow risers, curves and winders, dramatic lighting, sizable landings, and rich materials—all of these can be used to make stairways monumental. For example, Sir Norman Foster designed a dark green granite staircase with 16-inch treads and five-inch risers for his 1994 addition to the Joslyn Art Museum in Omaha, Nebraska. The stairs, which lead from an atrium to the museum's galleries, provide a slow and easy ascent, and broad landings present a nice place to pause and view the art as well as other museum visitors.

Harnischfeger Industries, based in Milwaukee, is a manufacturer of heavy mining equipment. But the staircase in the atrium of the firm's new headquarters, which overlooks Lake Michigan, is delicate. "The client wanted it to be as transparent and light as possible; they didn't want it to block the view of the lake," says Michael Brush, who designed the stair.

One solution would have been open risers, but these are prohibited by the ADA since it is easy for a climber's feet to slip through the open spaces. So he substituted the next best thing: glass. Each riser is made of half-inch clear tempered glass, which is fastened to the underside of the limestone tread above. Brush left a small gap between the bottom of the glass and the surface of the limestone treads to account for deflection—bounce in the treads and stringers. The staircase, which leads from the building's lobby down to the lower level, appears to float in space, but it is supported by a single steel post at the landing.

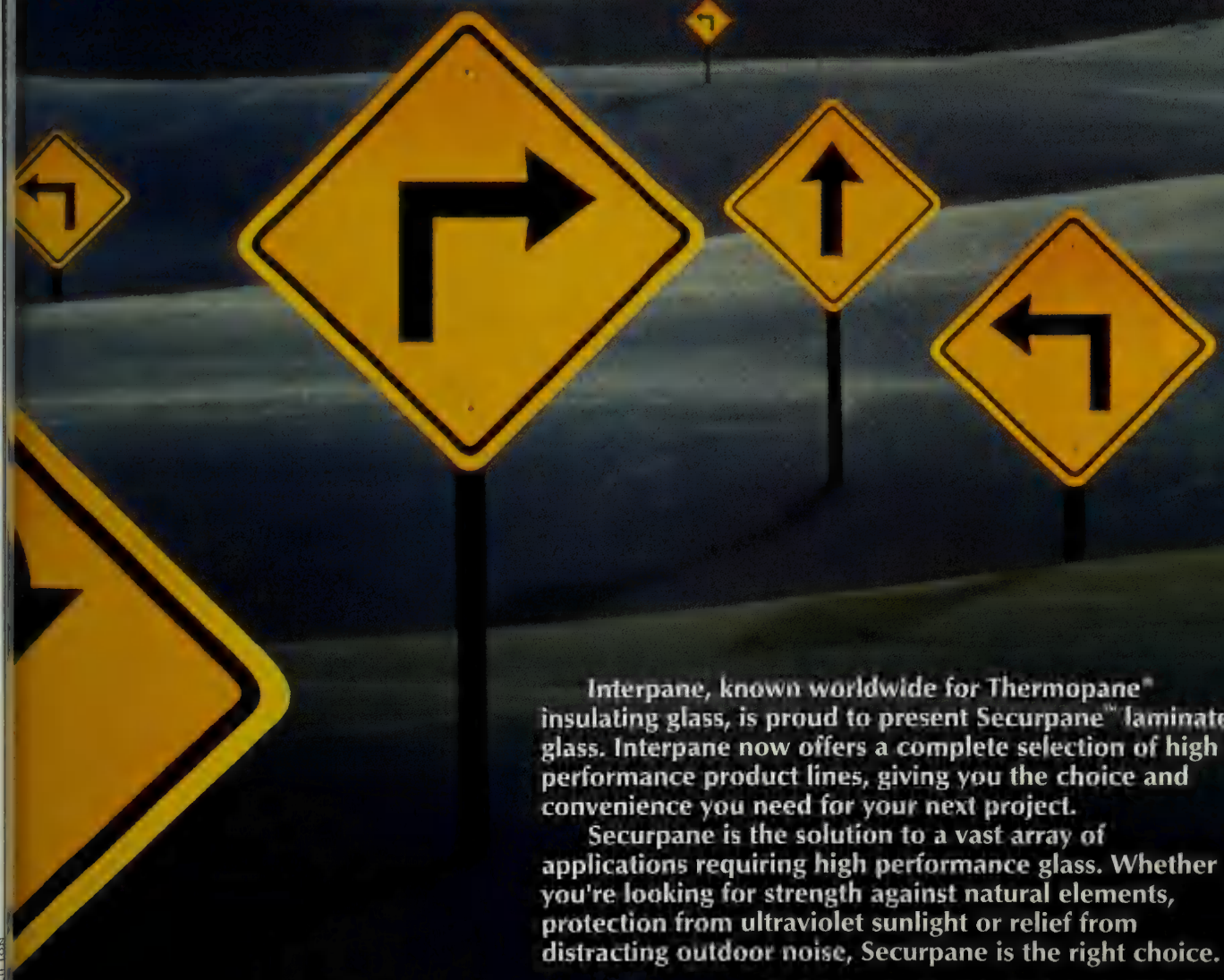
The railings are prefabricated, tubular stainless steel. This was the first time Brush had specified a premanufactured system—in this case by P&P Artec. In the past he's had steel railings custom made. "We just found

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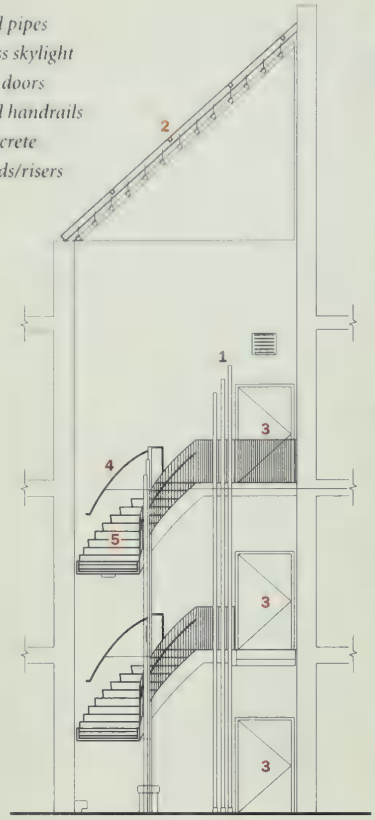
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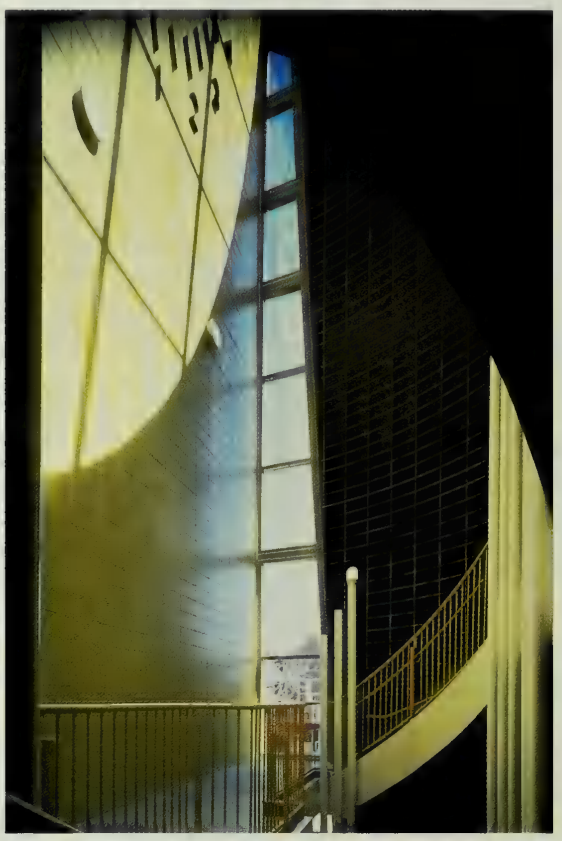
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HIGH PERFORMANCE GLASS

1. *Steel pipes*
2. *Glass skylight*
3. *Fire doors*
4. *Steel handrails*
5. *Concrete treads/risers*



NORTH-SOUTH STAIR SECTION



Sun shining through skylights onto an Aztec-inspired sundial illuminates the stairwell at the Little Village Academy (left), designed by Ross Barney + Jankowski. The stairwell tower is the building's major architectural feature.



that making these from scratch is more expensive and the work is often sloppier. The manufacturers we used here are already tooled up," he says. Using prefabricated elements, however, meant designing to the specifications of the manufacturer. "You almost have to begin with the railing and work backward," Brush adds. It also meant reconciling the structural steel reveals with the polished, rounded finish on the rails, a detail that took extra attention. The balusters run horizontally and are also used along the perimeter of the atrium. Codes discourage horizontal guardrails because children climb on them like a ladder. But since few children would be visiting Harnischfeger Industries, the horizontal rails were permitted.

The ADA requires a "cane detection device" when there's limited headroom, as beneath the landing of a staircase, to prevent a blind person from walking into the obstruction. To fulfill this requirement, Brush designed a wooden bench that mimics the curve of the landing.

Glass was also used to make a more inviting staircase inside a new gymnasium building at the College of Staten Island in New York City. William J. Conklin, FAIA, used eight-inch glass bricks to form the staircase's solid guardrails. Narrow vertical steel straps inside every other mortar joint make the rail strong enough to prevent it from being knocked over by "a group of jocks walking down the stairs," he says. The straps are welded to a steel frame at the bottom and screwed to a wood rail on top.

Because the stairs are designed to carry crowds of spectators to the gym's sports arena, "it had to be strong and secure," Conklin says. "But I also wanted it to be light and buoyant. I wanted it to be like a gracious hand, reaching down from above." To achieve that effect, the architect used red-painted steel rods to suspend the staircase from the ceiling. The treads are 12 inches deep and made of granite; the risers are six inches and made of steel, painted white. The base of the staircase sits on a large block of black granite, allowing the entire structure to float above the floor.

New stairs in an old building

Damaged in the 1989 Loma Prieta earthquake, the 1905 United States Court of Appeals building in San Francisco was in need of a major renovation. The task was given to Skidmore, Owings & Merrill's San Francisco office. Chief architect Craig Hartman, FAIA, created a new skylit atrium in what had previously been a dark interior area. The atrium now serves as a library and reading room for staff attorneys.

"Although our design provided convenient staff access by other direct stairs and elevators, linking all levels of the new structure, the atrium looked empty, instead of like the active hub of a new courts facility," Hartman says. The solution was to add a staircase to create "a visual anchor and hierarchy, and as a way of communicating the idea of connectedness and accessibility in the first moment one encounters the atrium. The poetics of sequentially revealed space that is possible through the use of stairs adds drama to the library." The staircase serves as both a symbolic and a functional device.

Like Michael Brush, Hartman had originally wanted to use open risers to lighten the look of the stairs but couldn't because of ADA requirements. Instead, visitors enter the stairs through a "screen wall" composed of wood and stainless steel. "This wall is punctured with large openings to provide access to the stair and smaller openings to provide captured views into the atrium," Hartman says. The stairs are cantilevered and make one dogleg between floors. Hartman used a glass balustrade, maple guardrails that match the paneling in the room, and steel handrails. The stairs are carpeted to create a quiet, opulent feeling.

Stairs animate the architecture of a space. They celebrate movement and hint at activities waiting on higher levels. "Stairs can be a very powerful architectural opportunity," Hartman says. The old carpenter in Santa Fe surely would have agreed. ■


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CIRCLE 77 ON INQUIRY CARD

NEW PRODUCTS

INTERIOR FINISHES: PAINTS, STAINS, AND THE FINE ART OF MIXING

Paint guru Donald Kaufman custom-mixed 150 colors for six of the buildings at Richard Meier's Getty Center. These included 50 shades of white and a variety of colors for the galleries that ranged from deep red to pale neutrals. Kaufman won the high-profile project by avoiding faddish or trendy interior finishes, as he discusses below. Continuing the focus on interior finishes, specifically commercial paints and stains, this page highlights various products on the market, from low-odor paints to colorful stains. Next month, look for the latest on metal cladding.
—Elana H. Frankel, Products Editor



"By the time trends are identified, they are already over," says color consultant Donald Kaufman of Donald Kaufman Color. "The pendulum is always swinging in terms of colors and styles, and lately the swing has accelerated. Ideas get used up so much faster. Basically, I see what everyone is doing and then do the opposite."

This philosophy has won Kaufman work with Richard Meier on the Getty Center; James S. Polshek on the American Museum of Natural History's planetarium; and the Catellus Development Corporation on the restoration of Los Angeles's Union Station. Though Kaufman was hired to custom-mix colors for these high-profile projects, he and his partner, Taffy Dahl, have also produced a collection of 37 ready-mades for residential work. 800/977-9198. Donald Kaufman Color, New York City and Santa Monica, Calif. CIRCLE 200

The stain game

The eight Fun Stains, part of the Wood Classics series of interior stains, sealers, and varnishes from Sherwin-Williams, include green, blue, and red tones. Stains can be applied to nonwoods such as fiberglass, metal doors, or concrete floors to simulate real wood. Also available is a low-odor paint system called HealthSpec, with a primer that quickly prepares surfaces for topcoating; a semi-gloss sheen; and a flat or eggshell finish. 800/552-7579. Sherwin-Williams, Cleveland. CIRCLE 201

Color talk

Glidden has four new color groups that have been categorized by mood. The Fresh collection includes light and airy colors; Vibrant is the strongest and most dramatic palette; Warm offers mellow hues; and Calm adds elegance and softness. Other paint resources from Glidden include *Color* magazine; IdeaCards, application photographs of Glidden paints; an interiors brochure; and stripe cards. 800/221-4100. Glidden/ICI Paints, Cleveland. CIRCLE 202

Odor-free paint

Duron's Genesis is an odor-free paint with no volatile organic compounds; it exceeds the EPA's method 24 test (the government's VOC standard). 800/72DURON. Duron, Beltsville, Md. CIRCLE 203

Low-e finish

Radiance, a low-e interior finish from ChemRex, applies, covers, cleans, and looks like latex. But because it is infused with microscopic particles suspended in a transparent binder matrix that enables it to act as an emissive barrier and a radiant energy reflector, Radiance helps reduce heating and cooling expenses. 800/766-6776. ChemRex, Shakopee, Minn. CIRCLE 204

Industrial flooring system

As a sealer, Benjamin Moore's M68/M69, a waterborne amine-cured epoxy, penetrates the surface, equalizing low-drying areas and substrate moisture. As a finish coat, M68/M69 protects wood and concrete surfaces against water, oil, greasy soils, salts, and chemicals. M70/M71, the company's 100 percent solids amine-cured epoxy, is nonflammable, low-odor, and low-viscosity. 888/777-3012. Benjamin Moore, Montvale, N.J. CIRCLE 205







Fun Stains (left); Vibrant collection (above); wall with and without Radiance (below); Genesis paint (right).


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▼ Have a seat

Smith & Hawken's outdoor bench, hand-hewed by Vermont stonemasons from slabs of granite with a subtly textured surface, measures 20¼ by 49 by 21 inches. 415/389-8300. Smith & Hawken, Mill Valley, Calif. **CIRCLE 206**



▼ The modular market

Nuances, a 36-inch textured, loop-pile, modular carpet from Milliken Carpet Commercial Markets, is available in three designs—Ornamental Terrace, Weathered Mosaic, and Herbal Array—and ten colors. The carpets are constructed of 26-ounce DuPont Antron Legacy nylon. 706/880-5511. Milliken, LaGrange, Ga. **CIRCLE 209**



► Poufs, pods, and UFOs

Brueton Studio's UFOs (Unidentified Flying Ottomans), designed by Jaime Bouzaglo, debuted at Chicago's NeoCon. They are fully upholstered and have five cylindrical steel legs with an Argento finish. 800/221-6783. Brueton, Springfield Gardens, N.Y. **CIRCLE 212**





▲ In Plains view

Looking for an Eames table, molded plywood chair, lounge chair and ottoman, or screen? Perhaps a Nelson platform bench, a Gaston lamp, or a James Irvine sofa? Look no further than Inside Design, Jim Huff's Oklahoma City design resource center. A St. Louis and Seattle transplant with a varied background in industrial design and interior architecture, Huff sells mid-century objects as well as pieces by young American designers like Blu Dot and Karim Rashid. The design center presents a variety of choices in terms of price, aesthetics, and periods, including what Huff calls "now design," to fulfill his goal of creating a niche for "'90s living" in the Plains states. 405/840-5858. Inside Design, Oklahoma City. **CIRCLE 207**



▲ Upholstery chic

In keeping with their corporate ideal of sustainability and industrial ecology, Guilford of Maine, a division of the Interface Interior Fabrics Group, has reintroduced its FR701 panel fabric with 100 percent recycled content and new colors. The fabric is also produced using more sustainable manufacturing practices. 207/876-3331. Guilford of Maine, Guilford, Me. **CIRCLE 210**

▼ Indoors or out

Created by Giati Design president Mark Singer, Azía is a 12-piece collection of teak tables, chairs, sofas, bar stools, lounge chairs, ottomans, and mirrors for interior or exterior use. Seats are available upholstered or with loose cushions. Other custom options include gold- or silver-leaf finishes. 805/965-6535. Giati, Santa Barbara, Calif. **CIRCLE 208**



▼ Au natural

Keilhauer's new environmentally friendly Chicago showroom, designed by Michael Vanderbyl, features surfaces of a one-inch-thick medium-density fiberboard (MDF) called Trupan. Fabricated from wood harvested from sustainable Chilean forests and distributed by Tumac Lumber, the MDF is also manufactured in a two-inch thickness. The material has finer fibers than particleboard. 425/258-2217. Tumac Lumber, Everett, Wash. **CIRCLE 211**



▼ Acoustical finish

The International Cellulose Corporation's spray-applied acoustic ceiling treatment, SonaSpray, was used on Monona Terrace in Madison, Wisc. A ¼-inch application to over 109,000 square feet gave the facility a noise reduction coefficient of .75. 800/444-1252. International Cellulose Corporation, Houston. **CIRCLE 213**





◄ Sliding doors

YKK AP America has introduced a heavy-duty, hurricane-resistant sliding door system for commercial property, YSD 400. The doors are shipped knocked down and YKK AP provides the necessary hardware. Transom frames are available to accommodate taller openings. Curtain-wall and sliding-window applications are also available. 800/955-9551. YKK, Atlanta. **CIRCLE 215**

► Effective communication

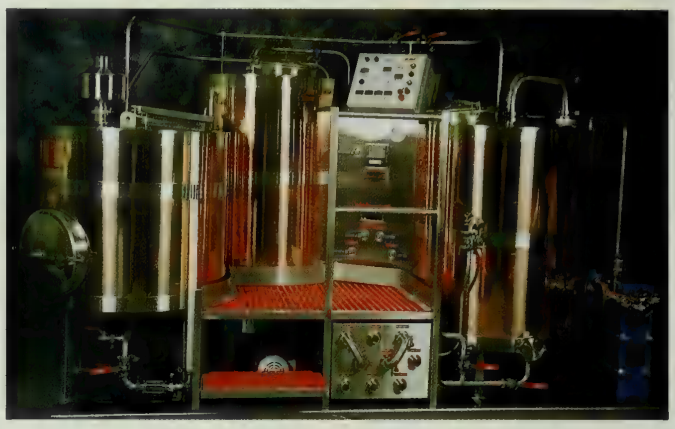
For presentations, Egan's Team Board combines whiteboard and computer technology with an interactive touch screen, a data projector, and a pressure-sensitive surface that allows your finger to act as a mouse. The Team Board can be flush mounted with wall brackets or hung on a track system. 800/263-2387. Egan, Woodbridge, Ont. **CIRCLE 218**



▸ Solar electric roofing panels

Uni-Solar shingles are laid out and nailed onto a roof like conventional shingles. Shown here is the Atlanta Southface Energy and Environmental Resource Center's roof covered with Uni-Solar shingles in a grid-connected system configured at 48 volts DC, using a 4,000-watt inverter. The total capacity equals 2 kilowatts DC. The Uni-Solar system powers a demonstration home and the center's offices. 888/UNI-SOLAR. Troy, Mich. **CIRCLE 219**





▲ Brewing services

DME's new 5 BBL Natural Brew system is designed for small start-up brew pubs or existing restaurant retrofits. It is fitted with polished stainless-steel piping (a copper-clad finish is also available) and is prewired to one junction box. The system is designed for easy cleaning and includes pump starters. Five barrels of beer are produced every 14 days. 902/628-6900. DME, Charlottetown, Prince Edward Island. **CIRCLE 214**



▲ Adjustable personal desk

The Biomorph interactive desk is ergonomically designed, with multilevel, height-adjustable work surfaces. The personal desk shown here is only one of a variety of available styles. 212/647-9595. Biomorph, New York City. **CIRCLE 216**

▼ Interior walls

Ytong's autoclaved aerated concrete (AAC) interior wall panels and partition walls combine cement, limestone, sand, and water to produce a lightweight material that meets a six-hour fire rating for eight-inch, non-load-bearing walls. AAC wall panels can be installed in 20-square-foot sections and can be pre- or field-cut. A ⅛-inch mortar joint bonds the system, eliminating the need for wood or metal studs. 800/YTONGFL. Ytong, Haines City, Fla. **CIRCLE 217**





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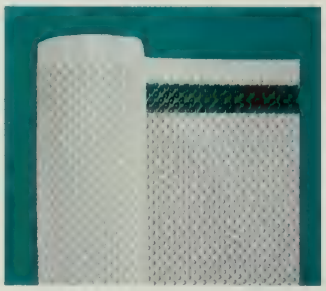
Hartco Flooring Company, 800-4HARTCO (800-442-7826) www.hartcoflooring.com ©1998 Hartco Flooring Company

PRODUCTBRIEFS



◄ Insulating sheathing

Foamular ProPink from Owens Corning is an extruded polystyrene insulating sheathing that features an advanced reinforced film laminate on both sides. Foamular is available in 4-by-8-foot and 4-by-9-foot panels and in thicknesses of ½ inch, ¾ inch, and 1 inch. The ¾-inch and 1-inch products are available with tongue-and-groove edges. 419/248-8000. Owens Corning, Toledo, Ohio. **CIRCLE 220**

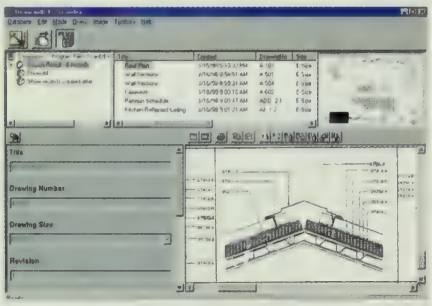


◄ Basement floor alternative

The dimpled, heavy-gauge plastic membrane Delta-FL is laid directly on concrete slab floors and overlapped by six inches to create a seal. To complete a subfloor, Delta FL is covered with plywood or OSB at the joints and anchored with concrete screws. 888/4DELTA4. Cosella Dörken Products, Beamsville, Ont. **CIRCLE 221**

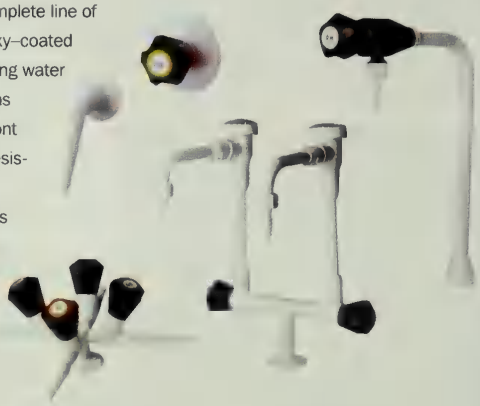
▼ Digital document control

ScanDEX, from Ideal Scanners & Systems, is a network/Internet software package that supports on-line access to large-format drawings and technical documents. It controls the scanning process, indexes drawings, stores them in a database, and provides search, browse, edit, and tracking capabilities. A special Web server allows archived material to be viewed using a standard Web browser. 301/468-0123. Ideal Scanners & Systems, Rockville, Md. **CIRCLE 222**



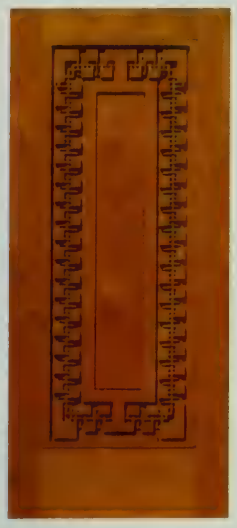
► Lab fixtures

Marklab USA offers a complete line of bright white, powder epoxy–coated laboratory fixtures including water fixtures, needle valves, gas cocks, and fume-hood front controls. The corrosion-resistant fixtures have been tested against substances such as hydrochloric and sulfuric acid and will not fade, discolor, or disintegrate over time. 412/967-1663. Marklab Laboratory Fixtures, Pittsburgh. **CIRCLE 223**





PRODUCTBRIEFS



▲ The doors
The Geometric II, shown here, is one of three hand-carved teak doors designed by Charles Gardner. Each door receives a branded imprint and edition number. Editions are limited to 45 examples of each copyrighted design. 800/792-3373. New Tomorrow, Garden Grove, Calif. **CIRCLE 224**

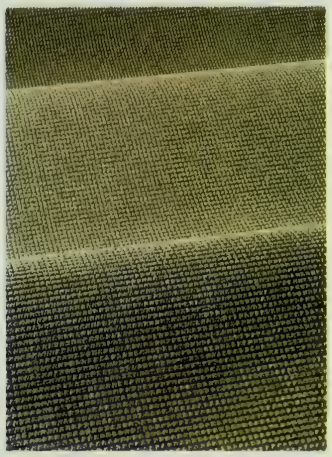


▲ Data center
Panel Concepts has introduced a second generation of TL2 stackable office system products that includes an integrated flat-screen video monitor, a CPU, and a teleconferencing station, as well as a temporary docking station for laptops. The system accommodates a retrofit. 714/433-3300. Panel Concepts, Santa Ana, Calif. **CIRCLE 225**



◄ Floored
"You can drive a forklift over it," says Matrix's Scott Moore of the company's solid-surface floor and wall tile called Madera. The tiles are 12 inches square, ⅜-inch thick, and weigh approximately two pounds each. Colors can be Pantone matched. 905/670-9070. Matrix, Mississauga, Ont. **CIRCLE 227**

▼ Textured loop carpet
Bolyu, a Beaulieu Commercial brand, has introduced Kinsale, a neutral-style carpet with the look of a knitted sweater, made of 100 percent solution-dyed nylon with 1/10-gauge construction. Vertical color variations combine with horizontal multi-level loops to form a small-scale grid design. Coordinated lines include two new Bolyu styles called Bantry and Limerick. 800/451-1250. Beaulieu Commercial, Chatsworth, Ga. **CIRCLE 226**





PRODUCTBRIEFS

▼ Formaldehyde-free MDF

SierraPine's collection of formaldehyde-free medium-density fiberboard (MDF) was shown at CSI and includes Medite FR, a Class 1 fire-rated board; Medex, a moisture-resistant MDF; and Medite II, a lower-cost alternative for interior applications. 916/772-3422. SierraPine, Roseville, Calif. **CIRCLE 228**





◄ Rolling service door

The reduced number of parts in Wayne Dalton's 800 and 900 series rolling service doors means extended operation, less wear-and-tear and downtime for repairs, and savings in maintenance costs. The doors are engineered to meet a 20 PSF windload. 800/827-DOOR. Wayne Dalton, Mt. Hope, Ohio. **CIRCLE 230**



▲ Step on it

Mercer's safety nosing is manufactured with a two-inch polyurethane insert for slip resistance. Available in vinyl and rubber, nosings accept ¼-inch flooring with a lip and ⅜-inch flooring without. Nosings come in seven lengths and 16 colors. Complies with ADA, OSHA, and California Disabled Access codes. 800/447-8442. Mercer, Eustis, Fla. **CIRCLE 231**

▼ On display

ALU, a company that designs and manufactures visual merchandising systems produced in Italy, has expanded its collection. The new Risers group includes freestanding shelves in various heights. New to the table collection are three Concorde tables available in black or chrome frames with solid aluminum tops and micro-veneer wood finishes. The box collection has six new illuminated rectangular designs made of aluminum and Plexiglas. 212/924-8713. ALU, New York City. **CIRCLE 229**



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PRODUCTBRIEFS



◄ Window options

Eagle's Maximizer Plus low-e insulating glass blocks up to 84 percent of UV rays. With a double weather-stripping system on all four sides of the frame and sash, the casements provide energy savings while surpassing grade 60 performance in accordance with NWWDA standards. Also available are a variety of decorative glass designs for windows and doors as well as a blind and shade system. 800/453-3633. Eagle, Dubuque, Iowa. **CIRCLE 232**

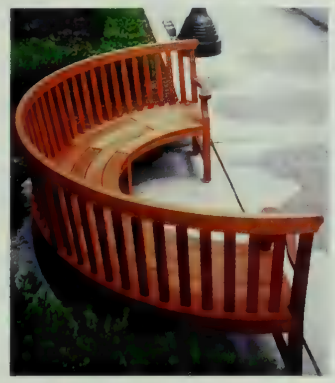
► Solid-surface table



Adden's solid-surface table series is made with an acrylic resin that looks like stone. Light gray, charcoal gray, sand taupe, and malachite green are available. 978/454-7848. Adden Furniture, Lowell, Mass. **CIRCLE 233**

► Seating around

Ten semicircular settees from Weatherend Estate Furniture were recently installed at Chicago's Navy Pier. Each mahogany settee features a custom radius of eight feet. To prevent staining and seasoning, several coats of wood preservative were applied, and all of the joints were structurally reinforced with marine epoxy. The furniture is also available in a high-gloss white or natural teak. 800/456-6483. Weatherend, Rockland, Me. **CIRCLE 234**





▲ Bending services

The Max Weiss Company specializes in steel shaping and recently completed the rolling and forming of the structural steel used in the rotunda at the Teaching, Learning, and Technical Center of Alverno College, Milwaukee. 888/649-3477. Max Weiss, Milwaukee. **CIRCLE 235**



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PRODUCT LITERATURE

Wood foundation

The Southern Pine Council (SPC) has published a fact sheet called "Your First Look: The Permanent Wood Foundation (PWF) System," which introduces basic PWF design features. 504/443-4464. SPC, Kenner, La. **CIRCLE 236**

Carpet design

"Square Feet" is the new catalog for Bentley, Interface, and Prince Street commercial carpets. 800/336-0225. Interface Companies, Atlanta. **CIRCLE 237**

Lighting catalog

The e•klips catalog, available on CD-ROM from Atum Software, presents products from a variety of North American lighting manufacturers. 514/725-5874. Atum Software, Montreal. **CIRCLE 238**

Windows and doors

Weather Shield's new product catalog includes information on the expanded ProShield vinyl-clad wood window and door series. 800/477-6808. Weather Shield, Medford, Wisc. **CIRCLE 239**

Ceramic tile

The US-149 Ceramic Tile Merchandising Items literature sheet showcases the United States Ceramic Tile Company's samples and displays. 330/866-5531. United States Ceramic Tile Company, East Sparta, Ohio. **CIRCLE 240**

Risk management

Victor O. Schinnerer & Company has published an educational resource for design professionals called "Guidelines for Improving Practice: Managing Risk Through Contract Language." 301/961-9800. Victor O. Schinnerer & Company, Chevy Chase, Md. **CIRCLE 241**

More windows and doors

Eagle's "Giving Vision to Great Ideas" highlights aluminum-clad and wood windows and doors. 800/453-3633. Eagle, Dubuque. **CIRCLE 242**

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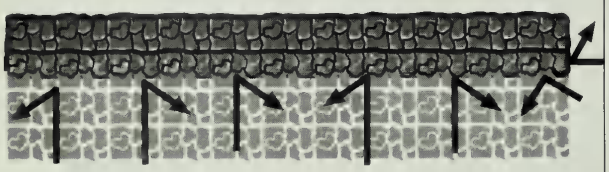
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PRODUCTLITERATURE



Award-winning binder

EFCO's Architectural Reference Manual received an honorable mention award in the Construction Specification Institute's Category E competition for specification binders. The two-volume set is also available on CD-ROM. 800/221-4169. EFCO, Monett, Mo. **CIRCLE 243**

Commercial openings

Andersen Commercial Group's new CD-ROM includes all the information found in its print catalog. This includes the company's architectural detail file—which provides illustrations of how windows and patio doors fit into different wall types, CSI specification information, and joining details—and its 1998 commercial product catalog. 800/426-7691. Andersen, Bayport, Minn. **CIRCLE 244**

CRSI information

The new eight-page, four-color brochure from the Concrete Reinforcing Steel Institute (CRSI), called "Epoxy-Coated Rebar Delivers Cost-Effective Value," gives an overview of epoxy coatings used in concrete construction to protect against corrosion. 847/517-1200. CRSI, Schaumberg, Ill. **CIRCLE 245**

Design kit

Pella's Architectural Design Manual includes CSI specifications and residential and commercial product guides. Available on CD-ROM. 800/84-PELLA. Pella, Pella, Iowa. **CIRCLE 246**

Concrete wall systems

The Mid-Atlantic Precast Association has a detailed, full-color brochure demonstrating the durability and various uses of precast concrete wall systems. 800/453-4447. Mid-Atlantic Precast Association, Hockessin, Del. **CIRCLE 247**

Dorm furniture

A new color brochure by Adden Furniture features solid oak furnishings from the Low Loft Group, designed for residence halls. 978/454-7848. Adden Furniture, Lowell, Mass. **CIRCLE 248**

Facade systems

The latest literature from High Concrete Structures provides architects with information on facades of various shapes and sizes, as well as weathering analysis and reinforcement recommendations. 800/PRECAST. High Concrete Structures, Denver, Pa. **CIRCLE 249**

Mastering the Fine Art of Color

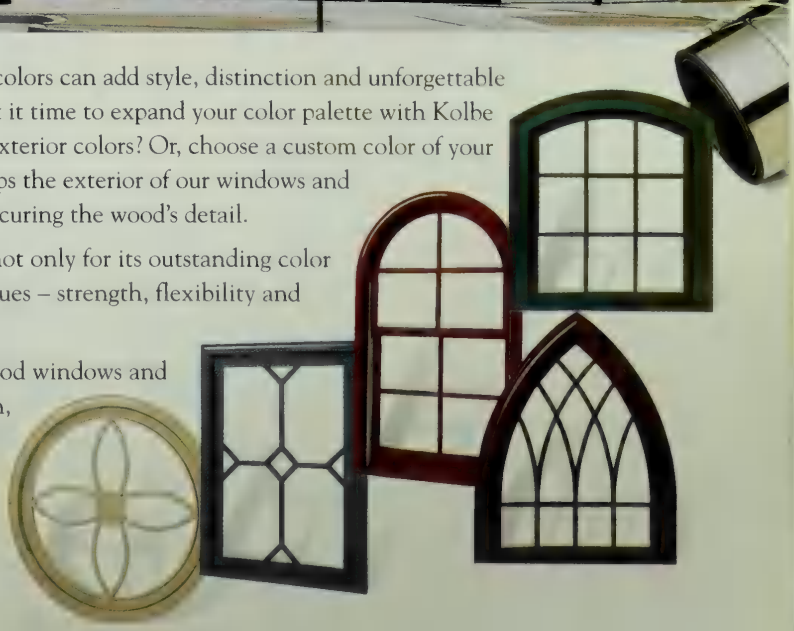




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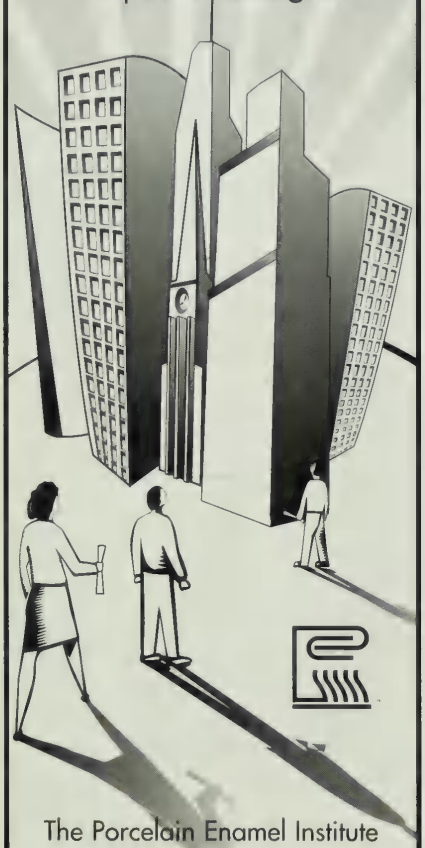






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(continued from page 71)

wood projects in two categories: completed wood buildings and architectural woodwork interiors. Projects must have been completed since 1995. Contact the Architectural Woodwork Institute at 703/733-0600, fax 703/733-0584, or E-mail jdurham@awinet.org.

Concept House '99

Submission deadline: October 30

Architects, designers, and product designers are invited to create a scheme for a speculative British terraced urban home, to be located on a brownfield site. The winning project, which must address broad ecological issues, will be constructed as the centerpiece of the 1999 Ideal Home Exhibition. Administered by the Royal Institute of British Architects. For more information, call Louise McKinney, 011/44/958/601526.

Accent on Architecture Grants

Submission deadline: October 9

Matching grants of up to $3,000 are offered to local organizations for outreach programs that result in an increased public awareness, appreciation, and understanding of how involvement in the design process can enhance the quality of life in a community. Write American Architectural Foundation, 1735 New York Avenue N.W., Washington, D.C. 20006, call 202/626-7300, or fax 202/626-7420 for information.

Tilt-Up Achievement Awards

Submission deadline: October 15

The Tilt-Up Concrete Association announces its sixth annual awards to recognize tilt-up structures that are outstanding in their aesthetic appeal, creativity of design, application of materials, or advancement of the industry. Construction must have been completed by September 1, and the building team must include at least one member of the Tilt-Up Concrete Association. Write TCA, 107 First Street West, P.O. Box 204, Mount Vernon, Iowa 52314, or call 319/895-6911.

Library for the Information Age

Registration deadline: October 15
Submission deadline: January 31, 1999

The first international Web-based architectural design competition, sponsored by the Association for Computer-Aided Design in Architecture, calls for the design of a library that takes full advantage of information technology while still serving the library's roles in culture and society. Proposals may incorporate spatial simulation and/or physical solutions. Open to both student and professional designers worldwide. For information, visit www.acadia.org/competition/.

Design a Conservatory, Win a Conservatory

Submission deadline: October 26

Sponsored by David C. Bishop and Co., this contest focuses on a garden room theme, including the creative use of furnishings in both the interior and exterior landscape. The winner will receive a freestanding 12-foot octagonal conservatory created for this event. Call the Merchandise Mart at 847/729-9812 or visit www.conservatories.net.

Steel Joist Institute Design Awards

Submission deadline: November 13

These awards recognize outstanding design in steel joist construction. Projects, which will be judged on the basis of flexibility, speed of construction, cost, and aesthetics, must have been built in the U.S., Canada, or Mexico within the last three years. Write Steel Joist Institute, 3127 10th Avenue, North Extension, Myrtle Beach, S.C. 29577, or visit www.steeljoist.org.

Rudy Bruner Award for Urban Excellence

Submission deadline: December 18

This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives $50,000; each silver medalist receives $10,000. For more information or an application, call 617/492-8401 or E-mail info@brunerfoundation.com.

London AIA Excellence in Design Awards

Submission deadline: January 15

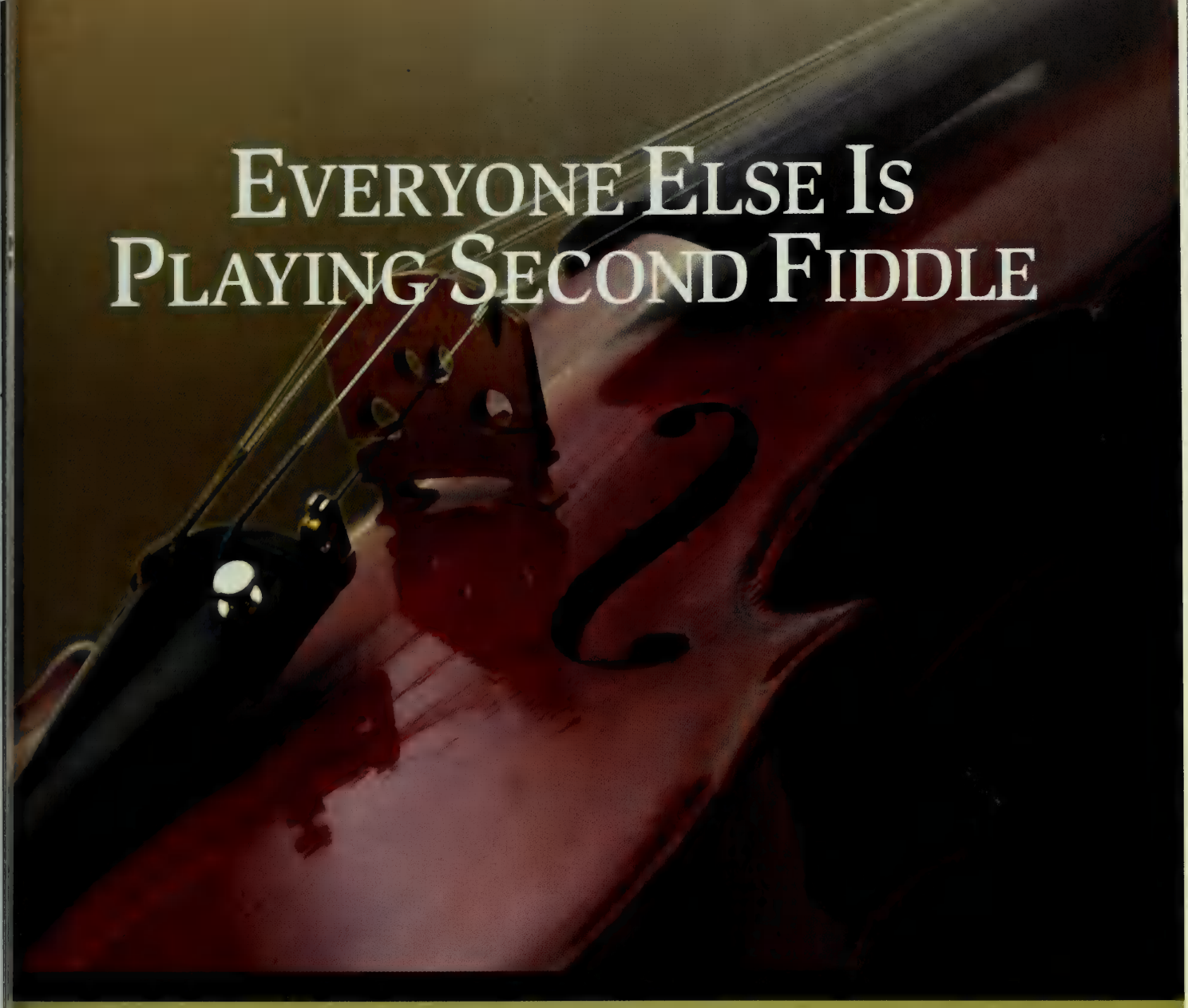
The awards program honors excellence in architectural design for work completed between January 1, 1993, and December 31, 1998. Eligible are projects by U.K.-based architects working anywhere in the world; projects in the U.K. by architects from anywhere in the world; and projects in the U.K by U.K.-based students. For more information, write AIA, Kent House, 14–17 Market Place, London W1N 7AJ, or fax 011/44/171/636-1987.

James Beard Foundation/Interior Design Magazine Awards

Submission deadline: January 29, 1999

Established in 1995 to honor excellence in interior and graphic design for restaurants, these awards are for projects in the U.S. and Canada. For information, write the James Beard Foundation, 6 West 18th Street, 10th floor, New York, N.Y. 10011 or visit www.jamesbeard.org. ■

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Instructions

- Read the article "Safer, More Attractive Staircases" (page 181) using the learning objectives provided.
- Complete the questions below, then check your answers (page 216).
- ◆ Fill out and submit the self-report form (page 216) or file the form on ARCHITECTURAL RECORD's Web site (www.archrecord.com) to receive two AIA Learning Units.

Questions

1. What are the causes of most stair accidents?

2. Which elements of a stairway are specified by code?

3. What are the parameters for the slope of a stairway?

4. How can a stairway be designed to be aesthetically pleasing and still meet code?

5. What is the relationship between stairs and elevators in a building?

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ANSWERS

Questions appear on page 214. To receive CES credits, fill in the self-report form below or on our Web site (www.archrecord.com).

1. Accidents usually take place at the top or bottom of the stairs, where there is an abrupt change in level and surface materials. People also fall because of inadequate lighting; obstructions on the stairs; distracting views; slippery treads; confusing patterns on the treads and risers; and crowding. Carpeted steps are more likely to cause a person to slip, although the fall is usually less serious. Statistics show that serious falls incurred during descent outnumber those in ascent, and that the instrument of injury is often the steps themselves.

2. National codes and the ADA specify the height for handrails and require that they be continuous along both sides of the stair. The diameter of the railing must permit a person to firmly grasp it and slide his or her hand along the rail. If balusters are used, they must be spaced close enough to prevent a child from falling through or being injured—four inches apart in most codes. The minimum and maximum size of treads and risers is specified, and limitations on the size and shape of the nosing are set in order to help a weak person pull his or her foot onto the next step. The maximum number of steps between landings—equaling a rise of 12 feet—is also specified. The width of a stairway is based on the occupancy load, but a minimum of 48 inches is required in commercial buildings. If the stairway is a means of egress from a building, it must conform to the National Fire Protection Association's Life Safety Code.

3. Research has found that the slope of a stairway is easier to climb at an average, comfortable speed if it is between 20 and 27 degrees. However, the proportion of rise and run also depends on what the stairs will be used for and where they are located.

4. The materials used for the treads, risers, and handrails can be varied to achieve an aesthetic solution for stairs. Using tempered glass for the risers can give the stairway a lighter feeling. Deep treads of dark or rich materials give a luxurious feeling to a stairway. Lighting can be used to enhance the design of a stairway, although shadows caused by the placement of the light source are a safety concern. Landings can be incorporated into the stair design to pace the movement, make the stair safer by creating a shorter "falling distance," or direct the flow of traffic.

5. The relationship between stairs and elevators is not formally fixed, but they generally are placed close to each other. When stairs are placed close to the elevators, it makes them easier to find in an emergency and convenient for use instead of the elevator. Stairs and elevators are usually separated when one is being promoted as the main means of transportation through the building.

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☐ "Safer, More Attractive Staircases" (page 181)
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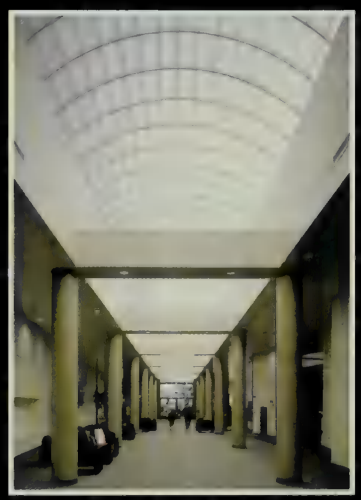
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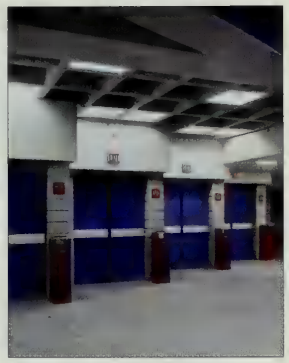


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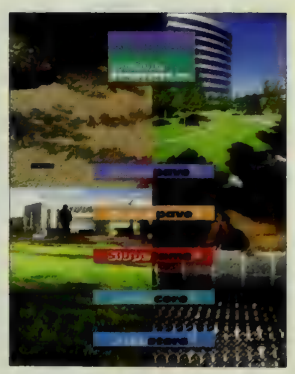


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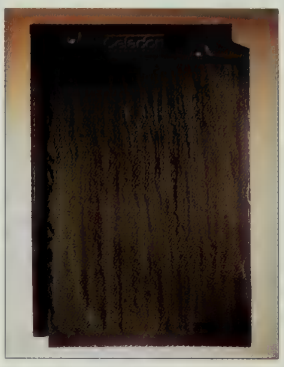


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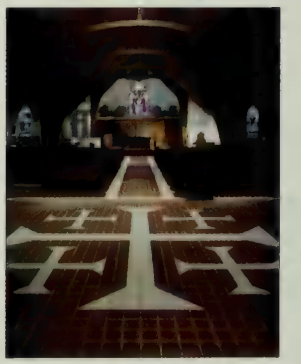


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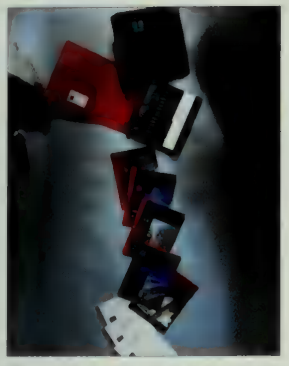
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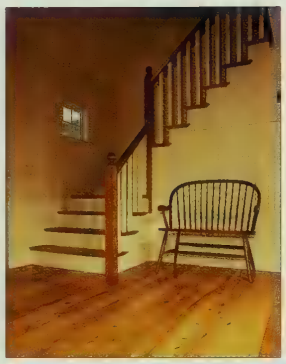


Springs Window Fashions provides the best value in commercial mini blinds with their Bali S3000. Premium features include curved headrail face, rear light blocking lip, aluminum slats with anti-static paint finish, hidden brackets, clutch tilter, all at standard cost. Privacy slat option provides enhanced light control with hidden cord holes. Springs also manufacturers Graber and Nanik brand products. Call SpecFax for information at 800-327-9798.

Springs Window Fashions

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Reclaimed, Remilled. Remarkable



Vintage Lumber Co., Inc. has been manufacturing exceptional antique T&G plank flooring since 1973. Our extensive selection, consistent quality, on time delivery, and technical expertise is unequaled in the industry. For more info call 800-499-7859 or fax 301-845-6475. P.O. Box 104, Woodsboro, MD 21798

Vintage Lumber

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Mercer Introduces Visual Safety Nosing

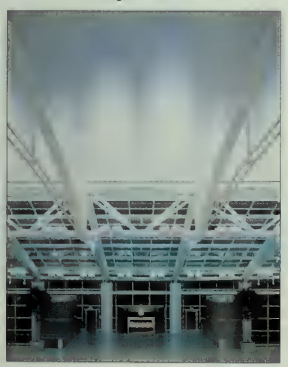


EUSTIS, FL - Introducing new visual safety nosing ideal for ADA applications. Manufactured with a 2" polyurethane insert for slip resistance, each nosing features a contrasting insert to increase vision at steps, protecting floor edges from extreme damage. Available in vinyl and rubber, in 7 lengths for various steps & risers, & in 16 Uni-Color System Colors. All nosings comply with ADA, OSHA & California Disabled Access & Canadian & Federal specs. T: 800-447-8442 or www.mercerproducts.com.

Mercer Products

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Luxalon Wide Panel Systems

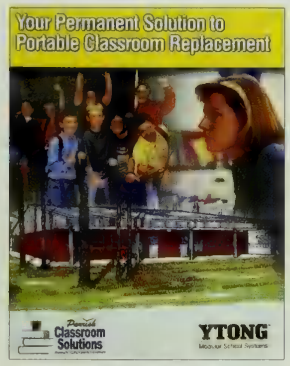


This revolutionary ceiling system offers nominal 12" (300mm) wide panels in lengths up to 19' 0" creating a clean, sophisticated, monolithic ceiling plane. Long spans are available with a soft beveled edge or a reveal edge. The system provides both acoustics and aesthetics with easily installed panels. Available in 8 finishes and 2 perforation patterns. For further information call 800-366-4327.

Hunter Douglas

CIRCLE 170 ON INQUIRY CARD

YTONG Modular School Systems

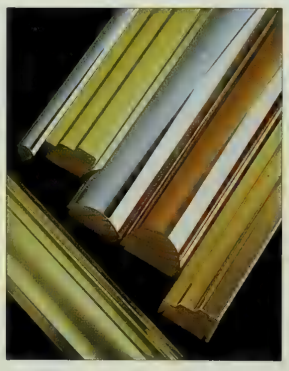


YTONG Modular School Systems are ideal for replacing existing portable classrooms. Constructed of autoclaved aerated concrete (AAC), YTONG Modular School Systems are energy- and cost-efficient, easy to install, durable, safe in high winds & fire resistant. Interior & exterior finish & design options are available; completed classroom units can match existing school buildings. Available in the Southeast. For free literature call 800-YTONGFL (986-6435).

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Presurfaced Finland Birch Plywood

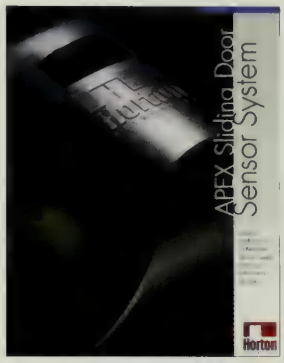


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Horton Automatics

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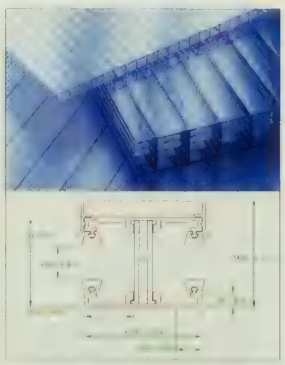


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Ancor Granite

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S+P Architectural

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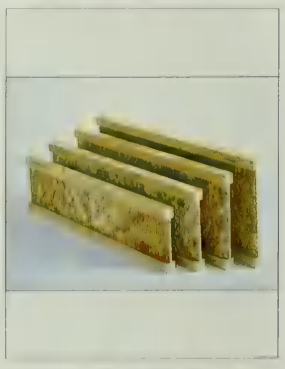


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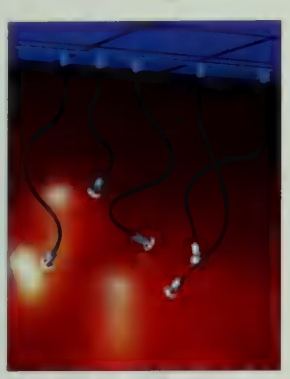
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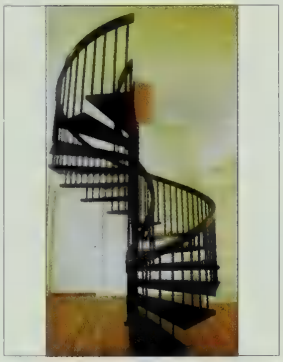


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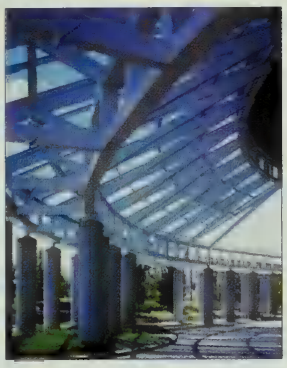


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Structural Steel An Architect's Guide

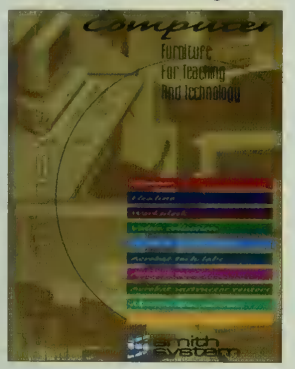


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ARCHITECTS

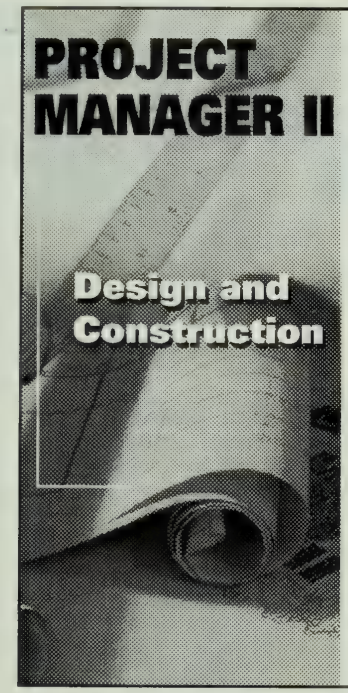
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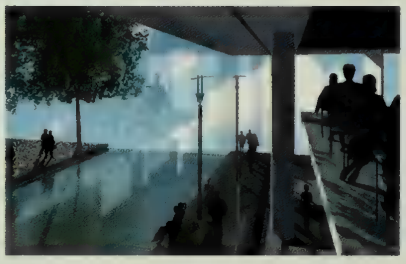
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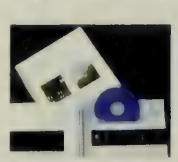
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THE FUTURE At home and adrift in a permanent—and permanently moving—residence at sea.

BY KIRA L. GOULD







In Edward Hale's 1865 story, "Man Without a Country," an extraordinary punishment is meted out to Philip Nolan, who, convicted of treason, curses his country: "Damn the United States! May I never hear her name again!" His jury complies, exiling him to a life at sea, a sentence of placelessness that eventually causes him to long for his homeland.

Things have changed. Today, rootlessness is global and glamorous. With a cell phone, laptop, and E-mail, there is no reason for the new elite (or the middle class) to stay in one place. Two new projects, the *World of ResidenSea* and the *Freedom Ship*, aim to bring a roving lifestyle to the next level, providing permanent—and permanently moving—ocean homes for the wealthy (and even the not so wealthy).

The project that's closest to realization, the *World of ResidenSea* (above), is scheduled to begin construction within months, according to Robert Burnett, president of ResidenSea USA. Bigger than most cruise ships (958 feet long, 15 percent larger than the *QE2*), the *World* will have 250 condominiums and will dock for a week at a time as it tours the globe, stopping at Cannes for the film festival, for instance, or in Rio during Carnival.

Thought it looks like a cruise ship, Lonnie Schorer, vice president of design for ResidenSea, insists that the *World* won't feel like one. "The atmosphere will be sophisticated and subtle, without the glittery features and fantasy," she says. A team of designers will collaborate with owners on furnished apartments (top right), which are selling (by invitation only) for $1.2 to $4.3 million. "These people won't be tourists," Schorer says. "The apartments—there are no cabins—will be their private homes; the public spaces are their village; and the decks are their neighborhoods. This is very much an urban project."

ResidenSea's *World* could hit the waters within two years, but even if the idea is a wild success, it probably won't have a great impact on traditional real estate trends—at least at first. "It's an interesting idea," comments Karen Danielsen, director of residential policy and practice at the Urban Land Institute in Washington, D.C., "but it's likely to be a fairly small market. It's basically a new kind of vacation or retirement package. For retirees who consider age-specific communities and even recreational vehicles, it could be another alternate lifestyle. On a ship, transportation and living arrangements are taken care of. And the lack of local and state taxes will surely appeal to many."

The *Freedom Ship*, planned by Engineering Solutions, Inc. (ESI), takes the concept of ocean living much farther. At 4,320 feet—longer than 14 football fields and nearly five times the size of the *World*—*Freedom Ship* resembles a tanker more than the *Titanic*. Norman Nixon, ESI's CEO and an engineer in Sarasota, Florida, says the design "is fairly simple. It's a flat-bottom barge." The 423 airtight cells will make *Freedom*, powered by 100 diesel engines and 100 propellers, "the safest vessel to ever set sail."

Nixon says he envisions a "real community," not a floating luxury resort. The superstructure, rising 25 stories above the water, will contain condominiums, stores, light manufacturing, hotels, restaurants, casinos, a library, schools, a hospital, and recreational facilities. "We want to make it an environment where people will want to spend time," he explains. They found, as many municipalities have, that people often associate open space with quality of life. "There will be nearly 200 acres of open space where people can run and ride bikes."

Eventually, Nixon envisions some 100,000 people living on the ship year-round. One of the biggest hurdles Nixon's company faced was bringing down the price of the dwellings. "Living on a ship with a bunch of rich people would have been a very sterile experience," he says. And though there won't be rental units, condos start at $100,000. "We have teachers and nurses who are interested in working on the ship and those folks need to be able to buy there."

Will the *Freedom Ship* be built? Compared to the cruise-line efficiency of the ResidenSea effort, Nixon's floating utopia seems a long shot. But if interest begins to translate into property contracts, *Freedom* could move forward; Nixon is hopeful that construction will begin this year. The magnitude of such a project's costs and complexities makes the risk of oceans becoming clogged with floating cities—leaving the brick-and-mortar ones empty—seem minor indeed. ■

Kira L. Gould is a freelance writer living in New York City.

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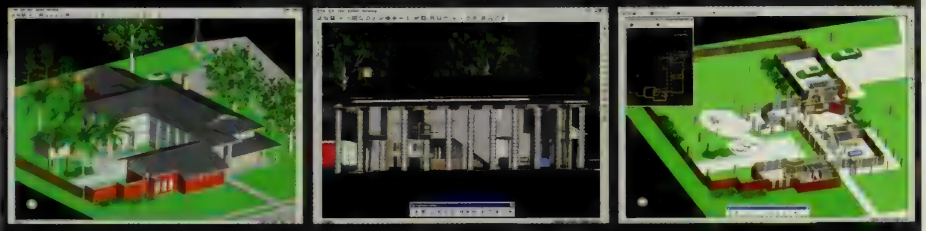
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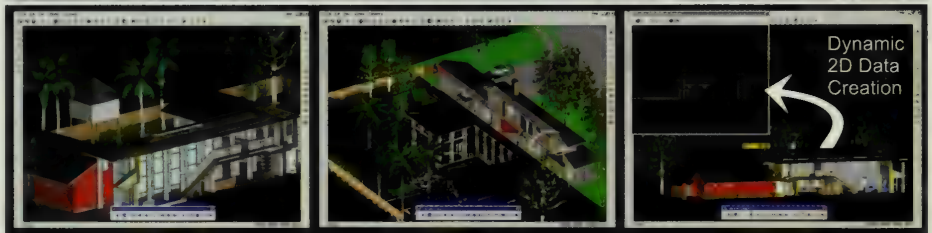
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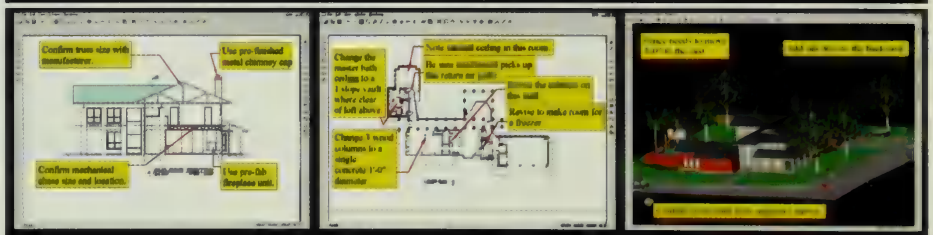
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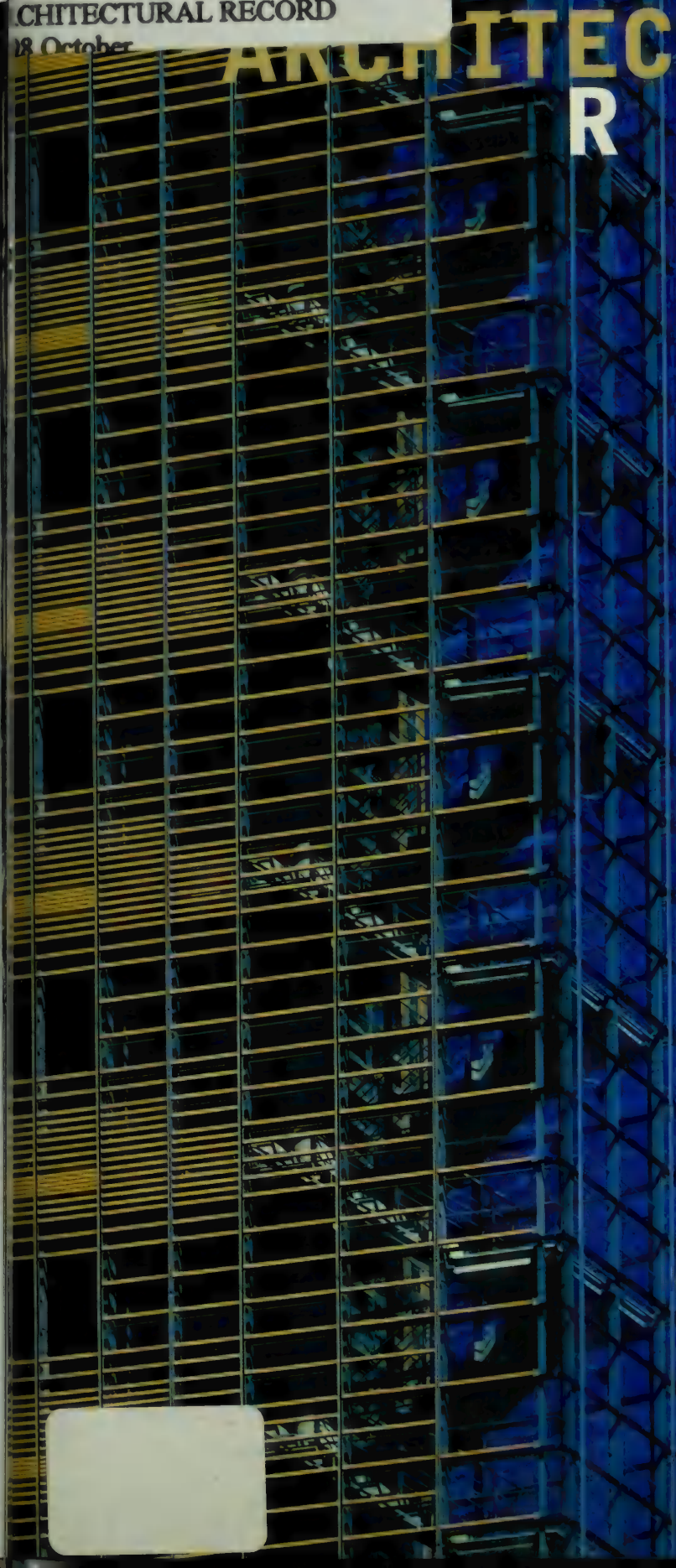
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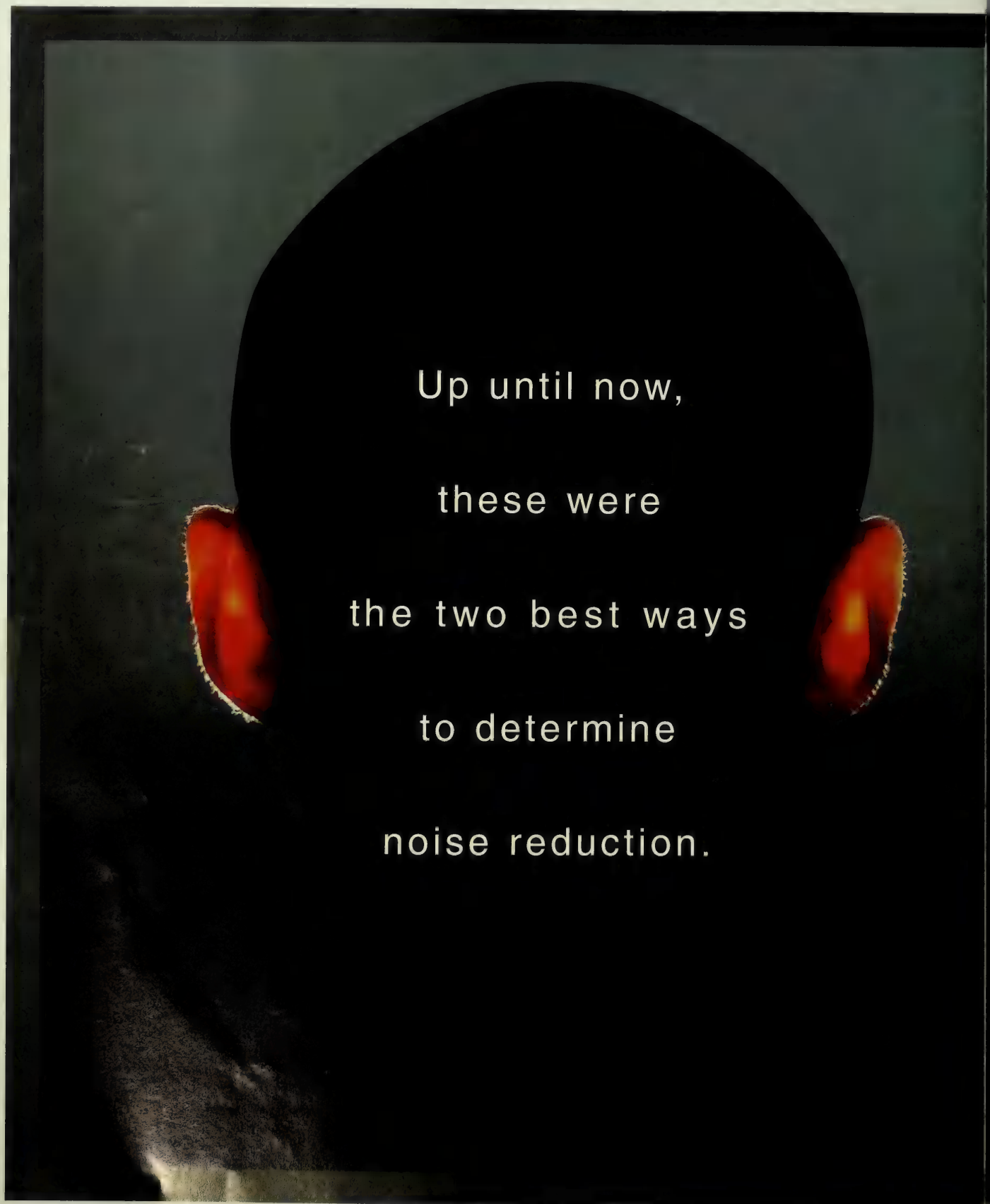
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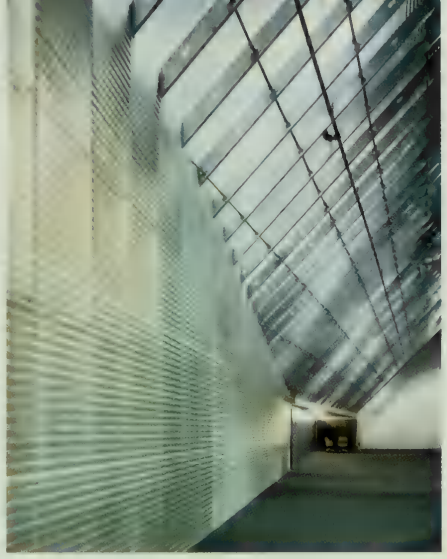
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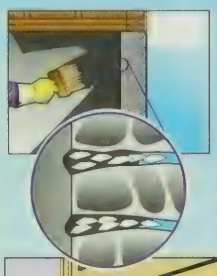
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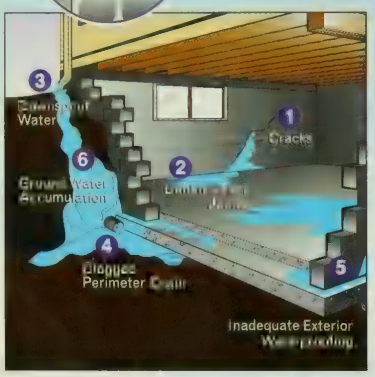
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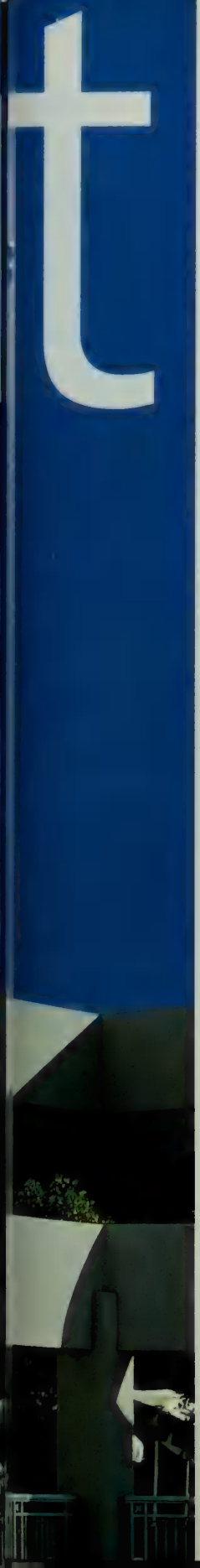
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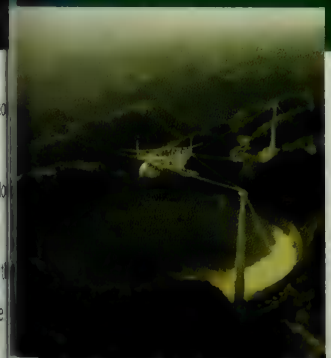
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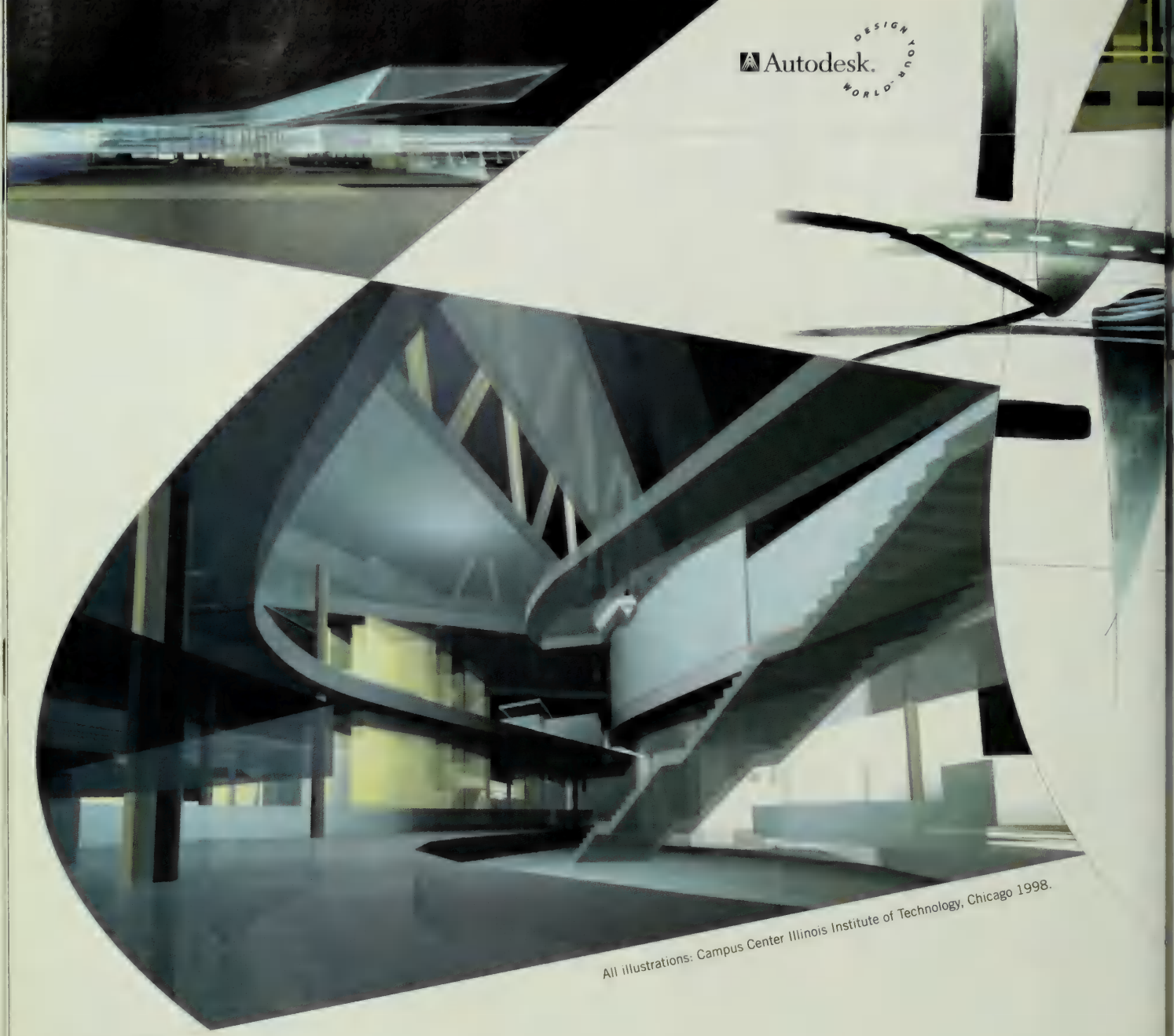
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CIRCLE 6 ON INQUIRY CARD



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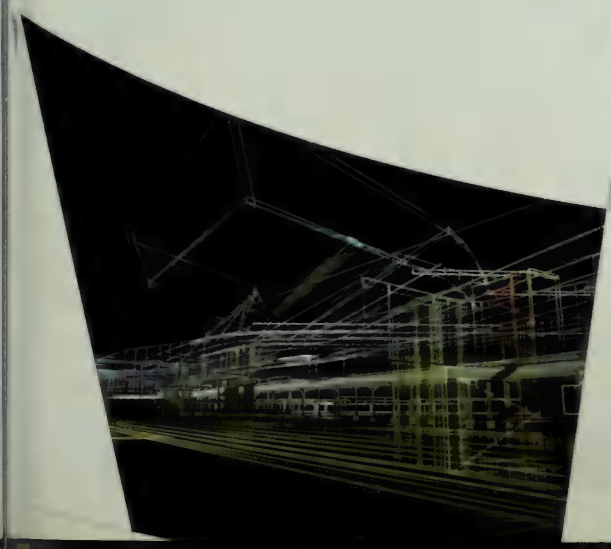
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CIRCLE 8 ON INQUIRY CARD



EDITORIAL

Not To Be Ignored

BY ROBERT IVY, FAIA

It is a subject we try to avoid, one we shy away from discussing. Many architects neither understand nor want to understand design-build: preconceptions and lack of knowledge about this project delivery method abound. Some say that it works best for repetitive, "dumb" projects like parking garages, or that quality invariably suffers in the face of time or money constraints. Architects often lament ceding their traditional, central role in planning and design to someone else, a nebulous "design-build entity" that employs the architect and horns in on what had been the design professional's turf. Some architects fear losing money; others fear the unknown.

No one, however, can afford to ignore design-build today. Statistics show that construction volume employing design-build is rising consistently and, according to the Design-Build Institute, is expected to surpass 50 percent of all building by 2010. Even though their data sound optimistic, we still must wonder what is attracting clients to design-build.

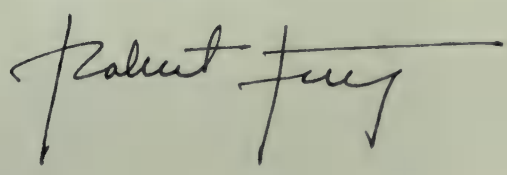
Simplicity is one obvious draw. A single contract with an early fixed cost can be seductive to clients who are tired of legal wrangles, change orders, and bid conflicts. Those paying the bills read the new relationship as offering "less lawyers, less money, less time." A 1997 study by Pennsylvania State University found that design-build is a quicker project delivery method—an amazing 33 percent faster than traditional design-bid-build, according to their research. Design-build also saved money in the study, though savings in money were less dramatic than those in time. And measuring quality remains problematic.

If design-build is attractive to our clients, the critical question for architects is how to benefit from it. One answer is to promote the architect as leader of the design-build team. Many architects, as comfortable on muddy job sites as in corporate boardrooms, already share a strong interest in the craft of building. Those who would like a more hands-on relationship with construction are likely candidates to lead design-build ventures.

Architects with specialties in a particular subject matter make another group of strong candidates to lead design-build teams. The company called IDEA, which programs, designs, and constructs buildings, grew out of the experience of Cambridge Seven Associates, authorities in aquarium design. Their success in one building type, which led to a separate design-build-management enterprise, provides an example for design professionals schooled in other specialized building types, including laboratories, hospitals, sports facilities, and theaters.

Financial rewards for outstanding performance may follow the leader, but greater control of a project's outcome, in terms of cost or completion time, can also mean greater liability if, for example, interest rates should rise or material costs skyrocket. Because compromises in quality may ensue, the right team is critical for a successful job: responsible clients, who know what they want and will make trustworthy partners; contractors familiar with other team members and experienced in the project type; and architects with education or training in business and a taste for risk.

Design-build is not for everyone, as team member or leader. Most architects are generalists by nature and training, capable of picking up new problems and applying a critical method, with results tailored for individuals and communities. However, for those architects who love the role of architect as builder, who seek more control of the entire design and construction process, architect-led design-build may be the path to greater satisfaction and, perhaps, higher compensation. Rather than ignore this new opportunity, let's learn about it, prepare for it, change it if we have to, and employ design-build when it is to our benefit. That would be designing, and building, success.





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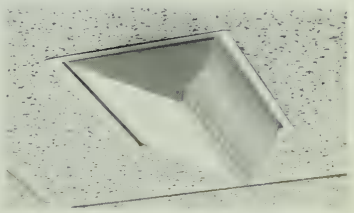


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CIRCLE 12 ON INQUIRY CARD

LETTERS

Lewin House overwhelmed?

The following rational and intuitive design decisions made on the addition to Richard Neutra's 1938 Lewin House will explain why my clients and I chose not to adhere to the preservationist philosophy championed by Thomas Hines in his criticism [August, page 74].

The current owners of eight years purchased the vacant lot next door to prevent construction of a large new home five feet from their property line and to add program necessities.

Parking at the beach is a scarce amenity. The Lewin House addition provided eight new parking spaces (three garaged) and storage with housekeeper's quarters above. These elements, on the street side of the existing house, formed an L-shaped addition that blocks out the constant roar of the adjacent highway and defines a tranquil courtyard.

The clients wanted a large entertainment area. The solution, a minimal pavilion with "disappearing glass," fuses into the courtyard. The pavilion's roof curve in section relates to the Lewin's half-round living room plan. The steel "spiderlegs" are a quote of and a respectful gesture toward a later period of Neutra's career.

I wanted to honor the essence of a landmark, meet my clients' needs, and take this home to the edge of the Pacific Century. Many technological advancements since 1938 have allowed us to carry out Neutra's vision of integrating the home into the landscape. I believe Neutra would be proud that we respected and reinvigorated his wonderful work, and were influenced by his ideas without resorting to mimicry.

—Steven Ehrlich, FAIA
Culver City, Calif.

The "liberty of a blank page" that Robert Ivy discusses in his August editorial [page 13] is sullied by what I consider to be an irresponsible and prejudiced commentary on a brilliant achievement by Steven Ehrlich.

I call Thomas Hines's attention to [Julius Shulman and David Glomb's] photograph at the top of page 76. How could Hines call this addition "overwhelming"? Hines did not evaluate Ehrlich's effort to diminish the horrible volume of traffic noise by dampening the sounds. Seismic activity is a prevailing concern as well, and the reinforced-concrete segments that Hines criticizes serve as anchors. And the "spiderleg outriggings"? The roof required support that would not be too imposing. So what if Neutra didn't use the spiderleg until later in his career? If Ehrlich realized that the design would function well, so be it!

As for the "public losing its encounter with this significant example of Southern California Modernism," I respond, "Where have you been?" The public roars past the house at 70 mph. Even in its early years, the house did not attract the public.

—Julius Shulman, Hon. AIA
Los Angeles

I drive by the Lewin residence every day, always looking for its facade in the jumble of jam-packed beach residences. Unfortunately, there are no views for passing pedestrians, except from the bluff above. Ehrlich, with the complementary assistance of his client, has managed to add to the street facade's presence with a strong element that now identifies it along the street, as well as screening it from the dirt and noise of the Pacific Coast Highway.

Every restoration architect is ultimately faced with the issue of adaptive reuse and preservation and must decide how to best bring older works into the 21st century. With the Lewin House, Ehrlich has done just that with a great deal of creativity, restraint, sensitivity, and craft.

—David L. Gray, FAIA
Santa Monica

Accessing Barragán

In your "Foreign Press Roundup" for August [page 46], Fernando González Gortázar equates the Vitra Design Museum's (VDM) purchase of Luis Barragán's professional archives with "looting." Given that the widow of Barragán's ex-partner openly sold these materials to a well-known and well-respected art dealer only after she was unable to find a buyer in Mexico (the dealer later sold the collection to VDM), this seems an oddly incendiary claim.

Judging from my knowledge and experience, the Barragán Foundation—now independent of VDM—has hardly "hindered the dissemination of what [Barragán] was" or "inhibited studies of his work"; the profusion of recent books and articles on the architect, whatever their quality, is enough to refute these claims. In fact, it is through the foundation's efforts that the first serious, archive-based studies of Barragán's work are now possible. The Barragán Foundation (whose staff of two has provided understandably limited access during the initial cataloging and conservation of the collection) deserves credit for its devotion to the paper legacy of an architect whose built legacy was so long neglected at home.

—Keith Eggner
University of Nevada, Las Vegas
Las Vegas

Warnecke's Federal Triangle

The "saga" you recount ["Project Diary: The Ronald Reagan Building," July, page 58] starts in 1920 and continues to the 1930s, but then leaps to 1986. What about 1967, when President Johnson proposed that the General Services Administration (GSA) retain John Carl Warnecke to complete the Federal Triangle? In contrast to Freed's design, Warnecke proposed a Modern exterior that worked in the context of Classical neighbors. This design was approved by both the GSA and the Fine Arts Commission.

Soon after being elected, Richard Nixon, acting through his young new cultural advisor, Daniel Patrick Moynihan, took Warnecke's design, which had been approved by the GSA, and gave it to other architects with closer ties to the administration for the completion of construction documents. The reason: Warnecke had been too close to the Kennedys and to LBJ. In any case, the scheme was never constructed.

—Warren A. Megrian, AIA
Warnecke Institute of Design, Art and Architecture
San Francisco

Three-headed monster

Your piece on the Ronald Reagan Building was just and fair in its summary of this complex project. We were the prime contractor for both the concrete frame and the stone skin of the project. Both were large trade packages of tremendously challenging scope and complexity. We believe mandating a single entity to control the project (rather than a three-headed entity) would have greatly enhanced the efficiencies of the project.

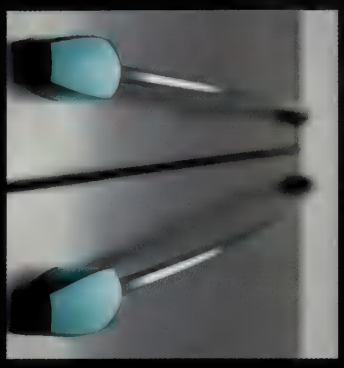
But hindsight is always 20/20. We take pride in having participated in this grand project. We can also vouch for the fact that the highest level of quality has gone into its finished fabric. This superior quality is due to the combined efforts of all the participating parties, from architects and engineers to the smallest subcontractor. This is a building that will stand in good service through the next century.

—Raphael (Rocky) Semmes
Business Development Manager
Tompkins Builders
Washington, D.C.

Craig Roeder tribute

I was very pleased to see the sensitive way in which your editorial in the Record Lighting section of the August issue commented on the passing of Craig Roeder [page 143]. Craig came to work with Jim Nuckolls and myself at Design Decisions, and I knew Craig during his entire professional career. He was a fine human being as well as





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CIRCLE 13 ON INQUIRY CARD

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—Jeffrey A. Milham, LC, FIALD, IES
New York City

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A/E collaboration

I read with interest C. Herbert Wheeler's article on the need for architects and engineers to be educated together [Speak Out, June, page 20]. It may be difficult to accomplish this admirable goal in the traditional college curriculum, with its competing demands on limited time. There is no reason, however, why such educational collaboration cannot take place in the continuing education environment.

In the early 1980s, I participated in a symposium which the Chicago chapter of the AIA cosponsored with the Structural Engineers Association of Illinois. Several hundred architects and structural engineers attended. I am not aware that such a joint program has ever been repeated.
—Paul M. Lurie
Schiff Hardin & Waite
Construction Law Group
Chicago

The educated architect

I believe Robert Ivy's praise of Clemson University's "ambitious experiment" will only serve to frustrate young architecture students as well as older practitioners [Editorial, July, page 7].

Architects are already burdened by being stereotyped as overeducated, artsy designers who know nothing of construction and building technology. Placing students in a College of Architecture, Art, and Humanities, as educators have done at Clemson, will only make students less like architects and more like the stereotype.

In the last few years NCARB and all the state boards increased the prerequisite for licensing to a four-year degree, then a five-year degree, then added the IDP program. Now you are suggesting that we go to a master's degree—and still we have graduates who cannot do what architects get paid to do: draft drawings of affordable buildings that conform to code.

When architects had a lot of influence compared to contractors, they did not need a college degree to take their state board exams. Changing the educational degree requirements does not seem to improve our status.
—Michael Regan
Columbus, Ohio

Robert Ivy's July editorial provided insight into the subtle struggle faced by architects. As an employee in the marketing and communications department of a technology company, I see similar communication deficiencies across myriad industries. I doubt you can find an organization, or an individual, who wouldn't benefit from broadened skills in the basics of communication.
—Christine Gillies
SMART Technologies
Calgary, Alb.

Credits/corrections

The photograph on the cover of the September issue should have been credited to Marco Lorenzetti of Hedrich Blessing.

In the August issue (page 51), ties designed by Civitas were described as being printed with roadmaps; they are actually printed with urban plans of various cities.

Steven Rooney and Natalie David were design assistants on the Coleman Pavilion (June, page 114). ■

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CIRCLE 15 ON INQUIRY CARD

SPEAK OUT An architect proposes 10 ways to get more involved with education and help produce better-prepared employees.

JUDSON KLINE, AIA

Judson Kline, AIA, is vice president and a partner at G. Herschman Architects in Cleveland. The firm recently helped implement an Introduction to Architecture program for middle school and high school students at the Cleveland School for the Arts.



Whenever architects get together, it seems the conversation always turns in some way to education—especially to employee development and a talent pool sorely lacking in well-prepared potential designers. Often, the conclusion they reach is that schools do not prepare students well enough to enter the field of architecture with skill and competency.

Many architects are concerned about an apparent disconnection between practice and education. But we architects cannot expect the schools to evolve without input; if we are concerned, we must take responsibility and get involved in the process. We must be proactive in promoting, supporting, and encouraging a more adequate preparation of potential architects.

Furthermore, the existing pool of architectural talent needs to be expanded if we want creative and fruitful competition to occur. There are a wide variety of opportunities to participate in working toward the goal of larger numbers of prepared graduates. A proactive approach to cultivating a connection between education and practice need not be limited to obvious or overly time-consuming tasks, such as teaching. Instead, I would propose the following 10 strategies for architects to get involved with the educational process:

1. Contact a local university's school of architecture and offer to participate as a juror for student projects. This can be done through the office of the dean or the chairman of the department.

2. Offer to be a "visiting resource" for a particular project being done in a school of architecture. In this role, an architect works with the students, providing input and criticism during development of a project, in much the same way that a design consultant works with the team in a project process.

3. Offer to be a visiting lecturer at the university. This provides an opportunity to illuminate the specific tasks and responsibilities that architects deal with in the process of managing a practice and producing projects.

4. Promote the *business* of architecture as an important component of any educational program. Practicing architects know that the profession is also a business, and they should convey that message at the academic level. That way, students will consider including business courses in their studies.

5. Participate in a curriculum group that will help develop courses of study that focus on business, codes, technology, or any other topics you may deem relevant but insufficiently covered.

6. If there's no university with an architectural curriculum in your area, consider working with a local community college. Often, these institutions have courses in architectural technology, computer-aided design, construction technology, and other related areas of study where a practitioner can actively participate and offer experienced guidance.

7. Develop a mentoring, "shadowing," or externship program for your firm or yourself. These types of programs can provide invaluable practical experience in the field. They are also a great way to identify prospective future employees.

8. Aim younger: promote interest at the high school level. This is key to increasing the number of committed, talented architecture students. Contact local schools to participate in career days. Talk to guidance counselors and become a resource for students looking to discuss requirements and direction in pursuing a career in architecture.

9. Magnet schools specializing in the arts provide a unique opportunity for architects to be a resource and facilitator for an architecture program. A firm can provide technological support or other advice, donate software, or arrange for relevant field trips.

10. If you know of a university, a school for the arts, or a community college without an architecture program, get involved in helping to create one.

Developing an association with a local university, promoting interest at the high school level, and cultivating links with other institutions will all help to advance the talent and quality of future architects. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*

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MENTORS In a world where big firms keep swallowing up smaller ones, be prepared for an acquisition or a merger.

JAMES W. COLE

James W. Cole is president of Systems Research Group, a Cincinnati, Ohio, firm that specializes in assisting architectural and engineering firms with mergers and acquisitions as well as with executive recruitment.



Architecture, like many industries, has recently been experiencing rampant consolidation. If your firm is on the small side, the opportunity to become part of a major firm may soon present itself. Older partners may be looking for suitors so they can bow out without having to worry about succession. But before plunging headlong into a merger or acquisition, you should know a few basics that will explain the steps involved and help determine whether you should enter the process at all.

Though an acquisition offer may be tempting, you must first explore whether it is the best avenue for your firm. As an alternative, an internal ownership transition can enable an owner to cash in equity over time and help minimize problems with capital-gains taxes. It also allows a firm to keep its culture and vision intact, avoiding outside influences that might get in the way of achieving the firm's objectives.

Internal transition is also a great way to hold on to key designers and future stars in a fiercely competitive employment marketplace. The success of this method, however, is dependent on having the in-house talent to provide the leadership once the current owner leaves the firm.

If you do decide that acquisition by or merger with another firm has merit, other considerations come into play. How do the corporate culture, design philosophy, and vision of the acquiring firm compare to those of your firm? Does your firm work in a particular niche that fits well with the other's existing practice? Will the change result in significant employee turnover? Key members of the firm have to be sold on the concept in order to minimize these potential conflicts.

If one firm has expressed an interest in acquiring your firm, it's possible that others are also interested. The problem is that you haven't heard from them. Running a blind ad in a professional trade magazine may help to solicit other potential buyers.

There are several management consultants who specialize in mergers and acquisitions within the A/E industry; they can be useful at all steps of the process. But test their knowledge and check their references and fee structures carefully. Also, be sure to execute a confidentiality agreement with any third party.

If your firm is considering a merger, one safe way for two companies to check each other out is to work together on a project. A joint venture is an excellent method for companies to check for compatibility of corporate philosophy and style. If, after completing the project, both companies are still interested, they should draft and sign a confidentiality agreement to protect financial information and trade secrets. Owners and principals can then meet, share information, tour one another's offices, and view financial records.

If you are in this position, bring in your accountant or a consultant with experience in valuating architectural firms, or at least professional service companies. Contact organizations such as the AIA or the Professional Services Management Association for the names of qualified consultants.

If you are an owner and you're looking to retire soon, you may want to consider how long the acquiring firm will want you to work on a daily basis, and in what capacity. Many firms are considered attractive targets solely because of the owner's name and good reputation. Their perceived value lessens dramatically without the owner's daily involvement.

A decision to sell will be determined, in large part, by the price offered and the ensuing negotiations. Is the agreed-on price payable at closing, or is it tied to future profit goals? It is not unusual for the due diligence and negotiating processes to take up to a year. Are you and your staff prepared to enter into such a long process? And would you be willing to sign a noncompete agreement upon your leaving if the acquiring firm asks you to?

Each merger and acquisition has its own nuances, but knowing the overall pattern and some of the potential conflicts can help you make the best decision for you and your firm if another growth-oriented company comes knocking. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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CIRCLE 16 ON INQUIRY CARD

OHNS MANVILLE

PULSE RECORD readers were asked: Are ADA requirements difficult to understand and put into practice?

Yes: What we have to do better is incorporate the requirements at the beginning of the design process, not during the construction document process. We must be cognizant of what is required and allow for it and also better inform our clients of the potential impact on the design and the budget of the building. This practice should be second nature, not a process of discovery during construction documents. Worse yet would be for the disabled to discover our failures in design after construction.
—Thomas Snearey, AIA
Senior Associate
Karlsberger Architecture, Inc.
Columbus, Ohio

No: Spend a day in a wheelchair and try to get around. Then you'll have a greater appreciation for what the disabled have to go through, and it won't seem like such an issue to meet the guidelines. Just do some research. There are plenty of publications out there to walk you through the guidelines. If you're a good designer, compliance with ADA is a breeze.
—Thomas Lonardo, AIA
Thomas Lonardo & Associates
Cranston, R.I.

Yes: The ADA is the most well intentioned, poorly executed piece of legislation in a generation. To knowingly draft a law that requires the courts to define that law is the height of irresponsibility.
—Douglas R. Campbell, AIA
ENG/GA
Asheville, N.C.

No: I think it makes things more complicated to take the ADA guidelines into consideration, and the design process would be a lot easier if we didn't have to. But as long as you take them into consideration from the start, it's not really a problem. We work with code consultants who handle matters of interpretation; when you have those guys in from the beginning, there are no surprises.
—Jonathan Cole
HNTB
Kansas City, Mo.

Yes: The ADA is a set of laws that were designed to accommodate the disabled. It is interpreted by various people—politicians, lawyers, judges, defendants, and plaintiffs among them—all with different ideas and notions of how to best make it work. As one of those interpreters, the architect has an extremely difficult time understanding a law that, due to changing technology, is in constant flux. The ADA is a feeble skeleton on which to found a design decision.
—Venkatesan Cadambi
WLC Architects
Rancho Cucamonga, Calif.

No: There are many guidelines, too many to commit to memory just by putting them into practice. But the guidelines are not difficult to find and not difficult to use.
—Michael Brush, AIA
Kahler Slater Architects
Milwaukee, Wisc.

No: I've been working with the ADA guidelines for some time now, and I've never had any problem interpreting them or understanding their intent.
—Oliver Purcell, AIA
Fisher Hecken Imbimbo, Inc.
San Antonio, Tex.

This Month's Question

Are competitions a fair, effective way to hire architects?

Clients are increasingly using competitions as a method of selecting architects for important projects—public and private. However, controversy often surrounds competitions. Architects complain that competition fees do not cover their costs, and initial schemes are often abandoned after the architect is selected. Critics fault the superficial nature of the selection process. What do you think?

Are competitions a fair, effective way to hire architects? ☐ Yes ☐ No

Copy and fax this form to 212/904-4256; or, to respond by E-mail, visit www.archrecord.com and click on News/Features/Dialogue to voice your opinion.

Note: Pulse reflects individual responses to each month's question and is not meant to be construed as formal research.

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CIRCLE 17 ON INQUIRY CARD





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– Graham Davidson, architect

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Architect of record: HNTB Corporation
Design architects: Hartman-Cox Architects
Graham Davidson, FAIA



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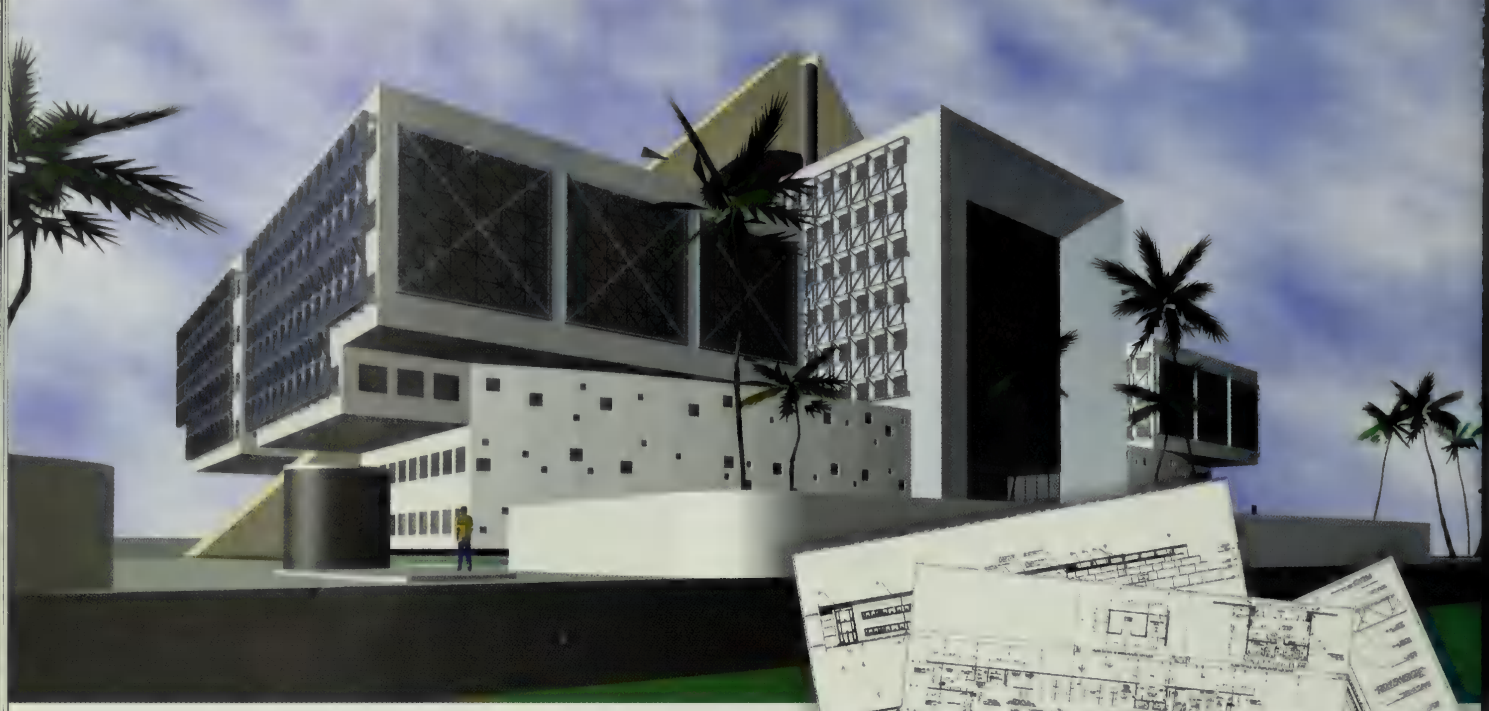
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CIRCLE 19 ON INQUIRY CARD

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CIRCLE 20 ON INQUIRY CARD

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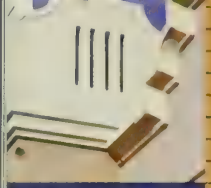
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CIRCLE 21 ON INQUIRY CARD



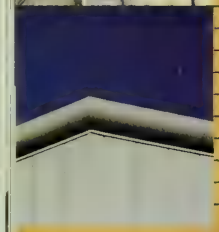
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CIRCLE 22 ON INQUIRY CARD

BOOKS Debunking the highfalutin, designing the outdoors, and improving the home: a trio of reviews.

Norman Weinstein writes about technology and the arts for Wired *and the* Christian Science Monitor.

Jonathan Hale is an architect and writer in Watertown, Massachusetts.

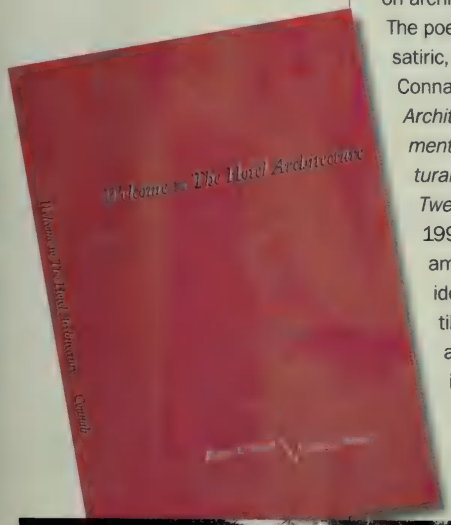
Christine Liotta Sheridan writes about architecture and design.

Welcome to The Hotel Architecture, *by Roger Connah. Cambridge, Mass.: MIT Press, 1998, 162 pages, $18.*

An epic poem about the history of ideas in modern architecture? As unlikely as such a project might appear at first glance, architecture critic Roger Connah offers just such an original creation, and in a highly entertaining and provocative fashion. Utilizing a broad variety of poetic styles (from rhyming couplets to blank verse, with a parody of a Bob Dylan song added for good measure), Connah playfully casts a critical eye largely on various linguistic and philosophical theories and their impact (real or imagined) on architectural practice.

The poem's overwhelming tone is satiric, debunking. Readers of Connah's earlier book, *Writing Architecture: Fantoms, Fragments, Fictions, An Architectural Journey Through the Twentieth Century* (MIT Press, 1990), will discover some amplifications of earlier ideas. The author's tastes tilt toward the Finnish architect Reima Pietila's impressionistic Modernism. He also has the bias one might expect from an architecture critic with a degree in literary criticism: he's suspicious of architectural theories of any school full of trendy buzzwords and imprecise phrases. As Connah wryly puts it in verse: "Jargon gets but one, and one chance only/Before inauthenticity, sad and lonely/Out on the cynical highway, ceases killing us."

The gulf between theory and practice catches Connah's attention constantly, and this "anti-epic" poem serves to raise nagging questions about how to bring the two harmoniously together. Readers in search of logically developed critiques of architectural theories should seek edification elsewhere. But anyone hungry for a poetic game of free-association through networks of linguistic and philosophical ideas affecting the profession will find much to savor. This is an enticing invitation, in Connah's words, "to leapfrog/Instead of hitchhiking onto the ideas of this century." *Norman Weinstein*





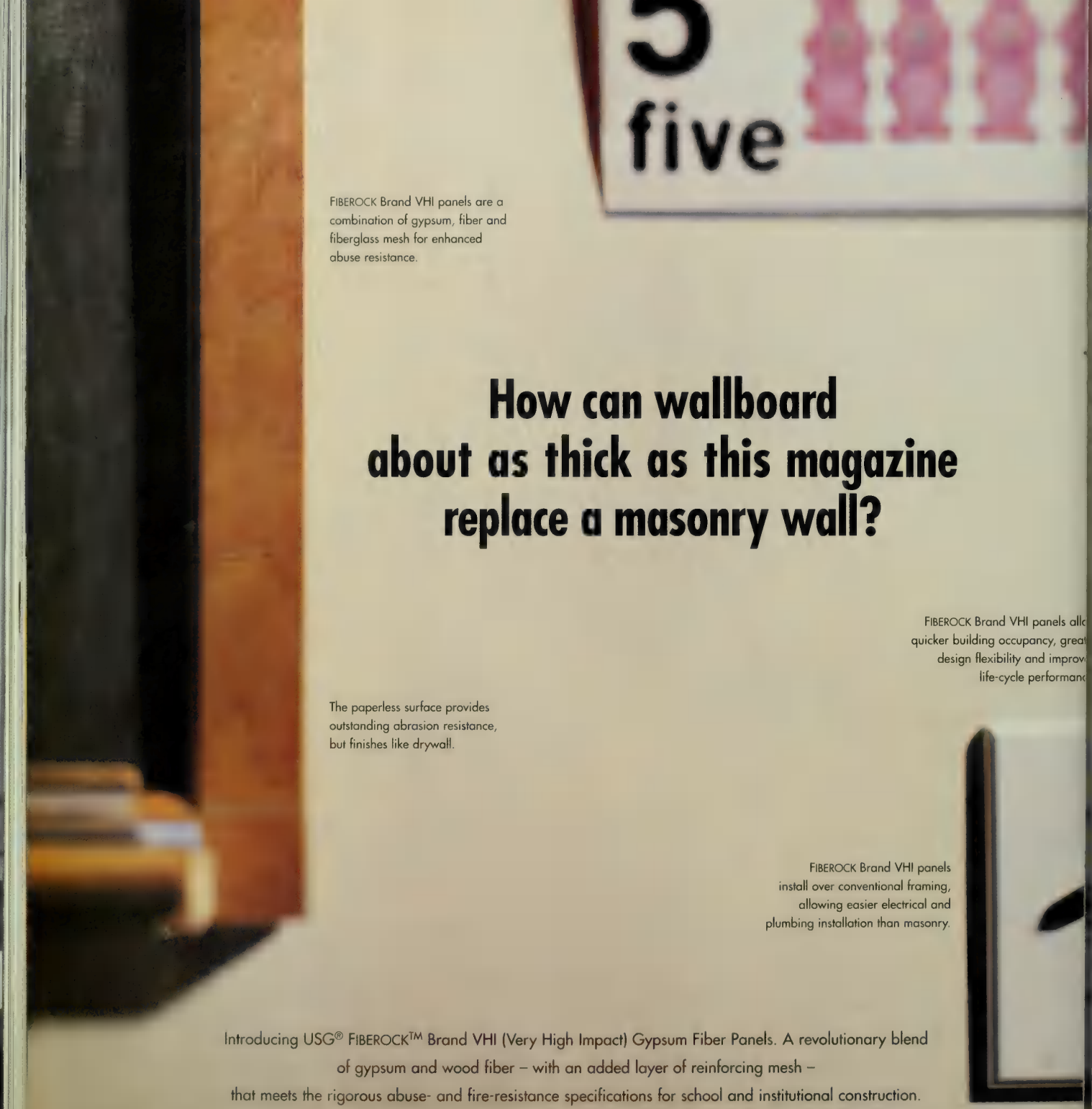
Connah's anti-epic poem (top) pokes fun at intellectual trends. A garden for Deere & Co. designed by Sasaki Associates (bottom) appears in Ward's book.

American Designed Landscapes, *by Alan Ward. Washington, D.C.: Spacemaker Press, 1998, 128 pages, $50.*

Part of the splendor of Alan Ward's *American Designed Landscapes* comes from the subjects: one great outdoor space after another. Part comes from Ward's photos themselves, which are full of surprises. Famous buildings, for example, here embellish, rather than are embellished by, their landscaping. And these largely unpeopled scenes are filled with intense visual movement. As Gary Hilderbrand points out in his introduction, Ward conveys a strong sense of reality in these artificial places through the high artifice of black-and-white photography. It is not incidental that the book is beautifully designed and produced. It's good to hear that this is the first of a series; Ward's next, on Dan Kiley's famous Miller Garden, in Columbus, Indiana, appears later this year. *Jonathan Hale*

Do It Yourself: Home Improvement in 20th-Century America, *by Carolyn M. Goldstein. New York: Princeton Architectural Press, 1998, 110 pages, $18.*

Taking as its subject the strange terrain where design, technology, domestic life, and consumer culture intersect, this witty book chronicles the growing preoccupation (read obsession) with home improvement in modern America. This movement received a shot in the arm after World War II when government loan programs and growing affluence made home ownership a reality for many American families. But the real focus of this book is the development of a cultural phenomenon currently embodied by Martha Stewart and celebrated on such television shows as "This Old House." Illustrated with kitschy visuals like period photographs and advertisements, the text explores the role of manufacturers, retailers, and magazines in fostering the cult of do-it-yourself determination. All of which may help explain why droves of us flock to The Home Depot on our days off. *Christine Liotta Sheridan*



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CIRCLE 23 ON INQUIRY CARD

EXHIBITIONS An installation on American lawns skillfully skewers backyard economics while overlooking the finer aspects of grass.

BY SUSAN DOUBILET

The American Lawn: Surface of Everyday Life. Canadian Centre for Architecture, Montreal, Quebec. *Through November 8.* Contemporary Arts Center, Cincinnati, Ohio. *April 4–June 7, 1999.*

If you think a lawn is simply grass and nothing more, the current exhibition at Montreal's Canadian Centre for Architecture could be an eye opener. Equal parts brilliant and infuriating, and not only in the ways intended by its curators, "The American Lawn: Surface of Everyday Life" takes an urbane and unsentimental—but slanted—view of its subject.

The exhibition, on view through November 8 in Montreal before moving to Cincinnati in April, portrays the lawn not as the natural field it once was but as the commodity it has become. As such, it is a fitting conclusion to the CCA's five-year, five-exhibition series, "The American Century." (For a related story on the CCA, see page 54.)

By the late 19th century, the innocent, functional clearing in the American wilderness had become a tool with which to vie, through size and lushness, for social status. This focus has only intensified during the 20th century, as the exhibition explores in dazzling detail.

Attempting to probe the very soul of the lawn, that ever-present green backdrop to outdoor American life, the organizers put forth a great effort to provide an installation of impeccable professionalism and style. However, while deliberately



and appropriately provocative—pointing out that in the pursuit of "nature perfected" we have lost sight of the idea of the natural, and are harming the planet in the process—the exhibition gets carried away by its own cleverness.

As a result, it often comes across as snobbish, prejudiced, and, like the commodity-making it scorns, a remote and incomplete reflection of its subject. It never gives credit to grass, a material that can be quite useful, or to lovers of grass, who get real, legitimate pleasure from its sensuality.

The exhibition does skillfully explain how landscape maintenance—a multibillion-dollar business—involves manipulation on every level. Suburbanites are always looking for new ways to keep up with the Joneses' lawns. Corporations control every manicured blade visible from their immaculate headquarters. Television networks insist on the most blemish-free, perfectly colored playing fields in order to increase the appeal of lucrative sports coverage. Politicians want to be photographed against a green background, in order to be associated with that American-as-apple-pie environment.

As "The American Lawn" explores the dark side of this no-longer-innocent construct, it becomes as manipulative as the theme it examines. Viewers are



Green patriotism in Kevin Foster's photograph *100 Years of Keeping America Green* (above); Robert Sansone's stereopticon images of College Station, Texas (right).

Susan Doubilet is coauthor of American House Now *(Universe) and the upcoming* Private Architecture *(Monacelli Press). She lives in suburban New Jersey and mows her half-acre lot.*



Weyerhauser's corporate headquarters, as pictured in the exhibition.

invited to disapprove of the environmental folly of irrigating a desert golf course, and we do. We are asked to shake our heads at the pettiness of lawsuits initiated by homeowners frustrated by a neighbor's lawn adornments, and we do. We are asked to smirk at the banality of dull suburban developments and to see lawn care as a sedative of the masses, pushed by community leaders—and, well, we do.

Finally, we are led to be suspicious of the suburban lawn's obsessively neat surface. Because suburbs, the exhibition conveys, are fertile territory for racial and class prejudices, and since a lawn's wholesome image provides the perfect cover-up, then it follows (or so the reasoning goes) that lawns, the emblem of suburbs, also symbolize discrimination and hidden crime.

It is no wonder we are easily guided through these arguments. The installation, by architects Diller + Scofidio, employs a compelling matrix of displays: videos, including one overhead that engages the viewer in the sprinkling of a lawn; stereopticons mounted on cables to provide comical 3D views down suburban property lines; historical books with sections highlighted by magnifying glasses; stunning photographs of minimalist corporate architecture; athletic shoes developed for gripping grassy fields.

The form, like the content of the exhibition, displays great creativity. But the shortcomings are serious. The show appears to be a survey and it has, in places, an almost scientific look, with photos of lawn diseases and patents for new grass species. Yet these are shown for purposes of derision, while the advantages of grass—its resistance to erosion and drought, for instance—are overlooked. The show expresses dismay at the environmentally disastrous effects of some lawn tending but doesn't point out the recent growth of the organic lawn business, nor the landscaping alternatives developed since the Green movement surfaced. Most significantly, it never connects viscerally to its subject: nowhere does one get a sense of the pleasure provided by the smell and feel of a lawn—which inspired the obsession in the first place.

Over the years, the CCA has upped the ante for architectural exhibitions. Its most recent installation can be ingenious, but while clever, it is not deep. The show takes easily grasped aspects of its subject and makes hay, rounding up the usual suspects—insipid suburbanites, controlling corporations, corny bureaucrats. While avoiding the most sentimental traits of its subject, it nonetheless makes a caricature of the lawn by cashing in on urban cachet and urban smirk. ■

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CIRCLE 24 ON INQUIRY CARD

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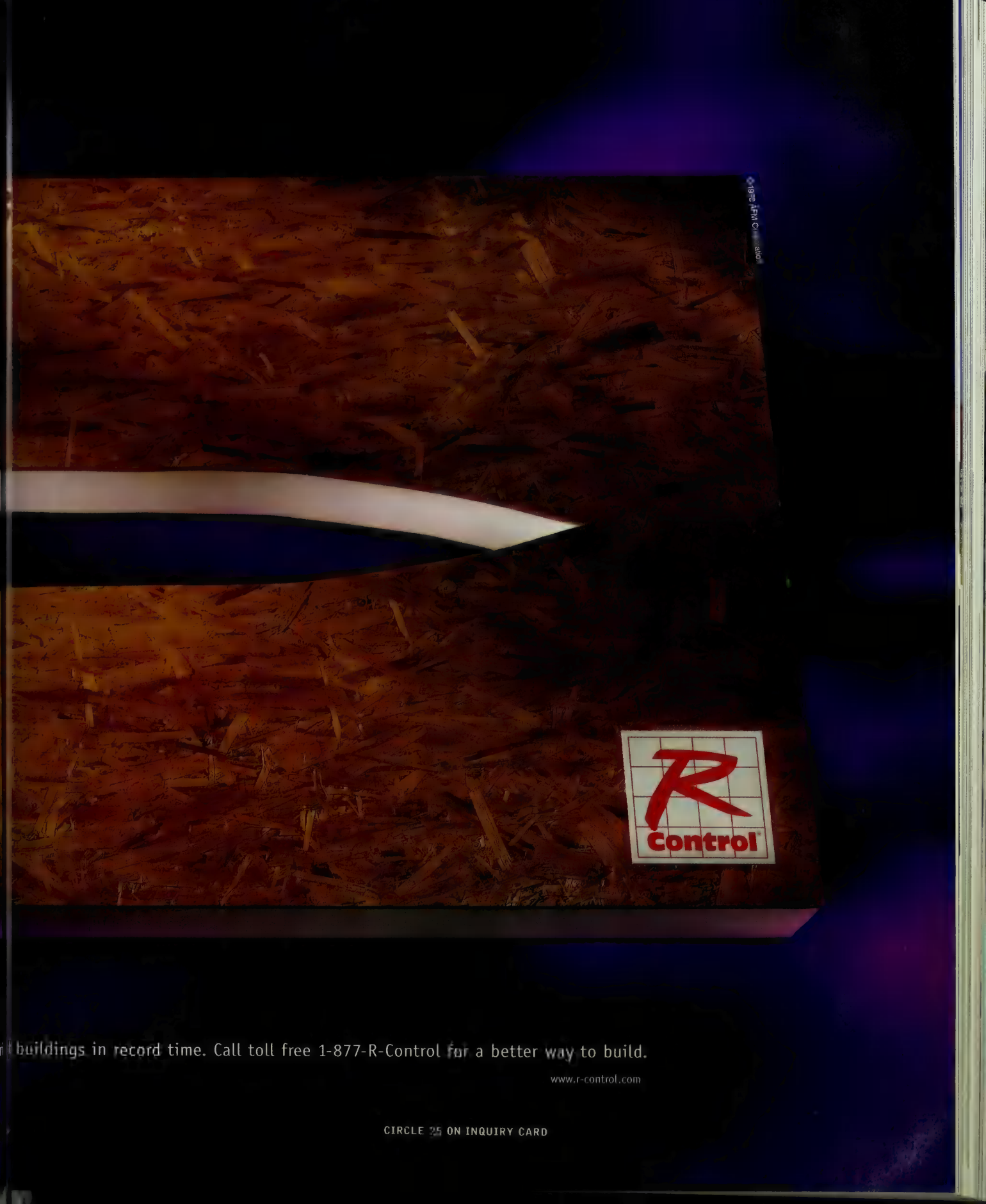
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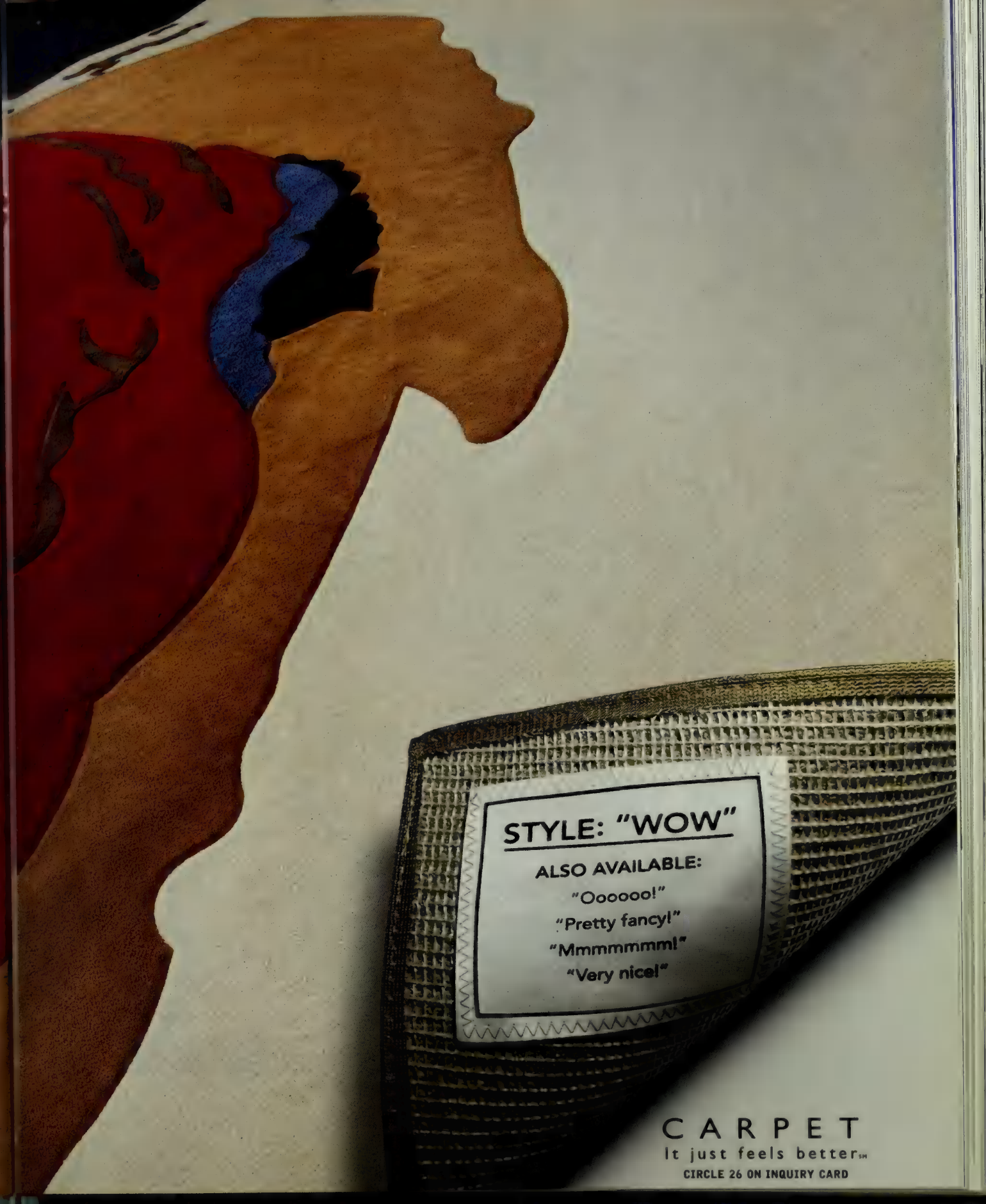


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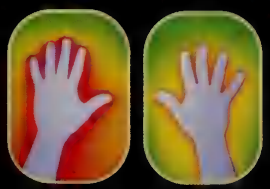
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CIRCLE 31 ON INQUIRY CARD

NBBJ CREATING COMPLEX PLAN FOR LARGEST OFFICES IN SCANDINAVIA

On a huge, scenic site overlooking the Oslofjord in Oslo, Norway, NBBJ is designing what will be the largest office complex in Scandinavia when it is completed sometime soon after the turn of the millennium.

The new headquarters of telecommunications giant Telenor will encompass 2.75 million square feet of offices, boulevards, and public pavilions, and will house 6,000 employees after the consolidation of 40 existing offices.

Telenor was able to secure the current location of the Oslo International Airport for its offices (the airport is closing this month and moving to a new site) and plans to begin construction in the third quarter of 1999. The cost of the first phase alone is estimated at $250 million.

NBBJ's team—led by design principal Peter Pran, AIA, who was born in Norway, and senior project designers Joey Myers and Jonathan Ward—worked on a module requested by Telenor of 30 people per office unit. The workstations and meeting rooms emphasize flexibility and openness.

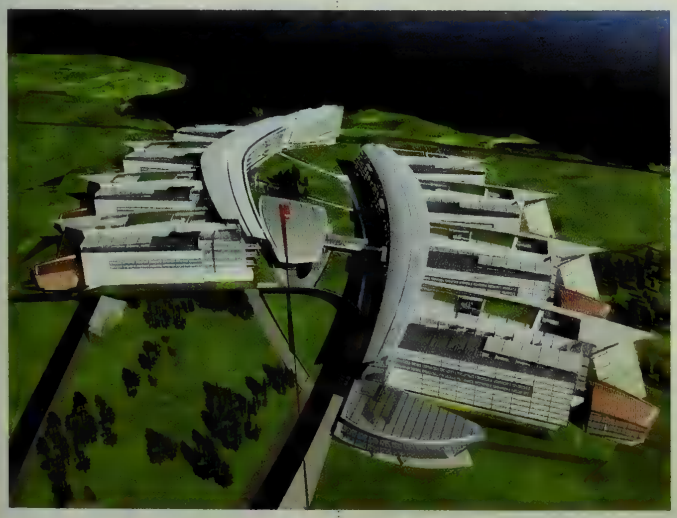
In an attempt to harmonize with the low-lying, waterfront site, the complex is set on the axis of the airport runway. At the center, two huge, curved glass wings run alongside one another toward the fjord. The offices fan out to the sides of these central wings, which will serve as circulation boulevards for workers and visitors traveling to the various outlying clusters.

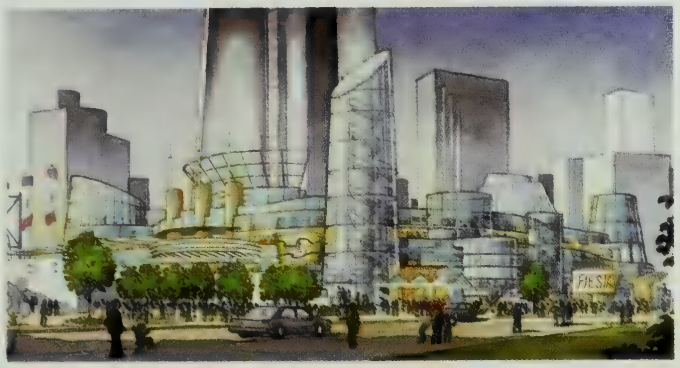
Pran says the glass boulevards will create a feeling of free movement and democracy among the Telenor staff, as the spaces invite communication and interactivity.

A large arrival hall at the complex's western end leads to an auditorium, exhibition space, cafeterias, and an expo center.

The basic office units are connected to the glass arms by bridges and recreational areas. Variety in the number of floors, the axial direction, and the views is meant to give unique identities to the different workstations.

At the eastern end of the new headquarters will sit Telenor's cultural center, which will include an art museum, a library, a theater, and other facilities. The center is intended for employees and guests, but for selected events the public will be able to use it—and enjoy excellent vistas of the fjord and downtown Oslo. *Soren Larson*





LOFTY CN TOWER PUTS FOCUS ON ACTIVITY AROUND ITS BASE

After aging ungracefully for 22 years, Toronto's CN Tower—the world's tallest freestanding structure—is in the midst of an $80 million, 375,000-square-foot renovation and expansion.

The recently completed, $17 million first phase, featuring 75,000 square feet of renovated and new entertainment, restaurant, and retail space, mainly around the base of the 1,815-foot tower, has replaced a tired-looking 1970s aesthetic with up-to-the-moment technology and design.

The developer, Toronto's TrizecHahn Corp., which leases the tower from the federal government, plans to proceed with the concluding phase next year. Details aren't yet determined, but the plans will likely revolve around a massive two- or three-story structure to welcome visitors and house entertainment facilities.

The 400-seat revolving restaurant near the top of the tower was refurbished a few years ago and a full-length staircase was replaced with an elevator. The developer then initiated the first phase of renovation, which centered on the construction of a landscaped courtyard with 20 ticket booths around the exterior, facing nearby Lake Ontario and adjacent to the SkyDome stadium. Inside are theaters and rides, a 12,500-square-foot shopping area with a duty-free shop, and a 300-seat restaurant.

Bregman+Hamann Architects (B+H) of Toronto designed the first phase and is working on the second; Ehrenkrantz, Eckstut & Kuhn Design Architects, of New York City, did the initial concept and master planning (Stan Eckstut and a former partner also did the master plan for Battery Park City and the World Financial Center in lower Manhattan.)

William P. Nankivell, a partner at B+H and the project architect, described the second phase as having "structural and sculptural elements using a lot of lighting and multimedia signage. There will be more of a focus on restaurants and entertainment than retail stores—[it] won't resemble a traditional shopping center." Part of the new complex will be underground.

Eckstut says the two phases represent an attempt to make the CN Tower "part of the city. . .to create more of an experience of city streets and sidewalks. You can work your way on foot through a variety of spatial and educational experiences before you take the ride up [to the observation deck]."

Bud Purves, TrizecHahn's senior vice president of development, says the revitalized tower will tie the city's major convention center, the SkyDome, and the downtown core together, particularly with an extension of a climate-controlled skywalk through various neighborhood properties and the building of a 500-car underground parking garage. "We have to make the CN Tower more of a living part of the city," Purves says. *Al Warson*

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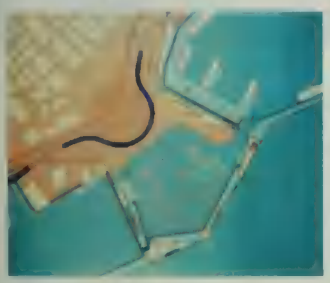
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RECREATIONAL DESIGN APPROVED FOR CANARY ISLAND PORT PROJECT

Jacques Herzog and Pierre de Meuron of Basel, Switzerland, have won a limited competition to revitalize the port of Santa Cruz, on the Canary Island of Tenerife.

Santa Cruz, capital of the Spanish province Santa Cruz de Tenerife, is cut off from its waterfront by a fenced, six-mile-long port precinct. The aim of the project is to bridge this area at its center, where a long pier called the link quay connects the city's Plaza de España to two long breakwater docks, and to redevelop the zone for recreational uses.

Santa Cruz de Tenerife seems intent on keeping its busy port in operation for the time being, especially the hectic passenger traffic from cruise ships and the port's connections to the other Canary Islands. But since the old port is located within the city's historic core, the shift to more urban-friendly activities is a natural development.



The competition, organized by the Tenerife Port Authority, follows the recent conversion of Barcelona's historic port to recreational and commercial uses. Similar redevelopment plans are under way for several other Spanish ports.

On Tenerife, Herzog and de Meuron's proposal (below) is arranged as a ring around a recreational marina. Low buildings for nautical clubs, restaurants, and marine services are linked at their rooflines to form a continuous, circular pedestrian promenade. Palms on lower platforms will produce the image of a garden when seen from approaching boats.

Among the other submissions, the London-based couple Alejandro Zaera and Farshid Moussavi proposed a multilevel construction in which the manipulation of horizontal or sloping "ground" planes was the main compositional device. Seville-based architects Antonio Cruz and Antonio Ortiz offered a group of buildings overlooking the marina, a design in which deftly defined public spaces occupy the background.

Finally, Rem Koolhaas suggested converting the link quay into a seaside entertainment pier and transforming the Plaza de España into a multilevel transport interchange. *David Cohn*

FRANCE TO OPEN ITS FIRST JEWISH MUSEUM **A museum of Jewish art and history, the first in France, will open in November in the heart of the trendy Marais district in Paris. The collection of the Musée d'Art et d'Histoire du Judaisme, which will cover the cultural and religious histories of Jewish people in Europe and North Africa, will be housed in a newly restored building that was once the Hôtel Saint-Aignan.**

The project was divided into two parts. The first, a renovation of the building's facades, grand staircase, and classical garden, was assigned to Bernard Fonquernie, an architect from the Office of Historic Monuments.



A major part of his effort was to revert the large rear garden, part of which was created by André Le Nôtre (designer of the Versailles gardens), back to its initial design and open it to the public.

The original residence, built in 1650 but extensively renovated in the 18th century, included one of the first known private dining rooms, which will be used as the museum café.

The second phase—the design of the museum itself, by architects François Pin and Catherine Bizouard—includes a main entry, galleries, a gift shop, offices, and an underground theater.

To present the museum's great diversity of rare objects, textiles, and manuscripts, the design features pristine oak and glass display cases, which take the form of partitions, tables, or even windowlike inserts in the timbered-roof structure.

Security obligations are most obvious at the entry. Visitors to the museum are brought in through a narrow checkpoint, circumventing the axial entry to the inner courtyard, whose dramatic, arched entry is infilled with two 14-foot-high panels of inch-thick security glass. ***Claire Downey***

YALE'S APPOINTMENT OF STERN CAUSES OPTIMISM AND CONTROVERSY

Last month, just as classes were beginning, Yale University named New York architect Robert A.M. Stern, FAIA, as dean of its School of Architecture.

For students and faculty concerned that the school had suffered recently from declining stature and a lack of leadership, the appointment provided at least some comfort. After not making an announcement over the summer even though it had a short list of four candidates (a group that did not include Stern), Yale seemed to have lost interest in immediately replacing Fred Koetter, a Boston-based architect who had announced over a year ago that he would be stepping down as dean.

Stern's status as a well-known and well-connected practicing architect more closely matches Yale's choice of deans in the past—including Paul Rudolph and Charles Moore—than did the four short-listed candidates, or even Koetter. None of the candidates, culled from both practice and academia, had inspired much enthusiasm when they were introduced in the spring, according to faculty and students.

Many expect Stern will attract the funds necessary to carry out a vital upgrade of computer facilities and the long-planned renovation of Paul Rudolph's Art and Architecture Building. "What Yale needed more than anything was a charismatic leader," says Oliver Freundlich, a second-year architecture student. "The second most important thing is money."

Because Stern is a famous traditionalist and a board member of a huge corporation, the Walt Disney Co., his appointment also inspired some protest among students who felt he would damage Yale's theory- and experiment-focused education, independent of any one style. Students were also angry they had no input in the decision; about 10 walked out during Stern's speech as the newly introduced dean.

"They might have supposed that I'm a white-haired guy, that I stand for some things strongly and would try to make the school in my image," says Stern. "They need not worry. Yale will be more open than ever under my watch." *David Simon Morton*

FROM SUBLIME TO SCANDALOUS: KEN BURNS EXPLORES WRIGHT



Ken Burns at the Guggenheim with his collaborator Lynn Novick, who codirected "Frank Lloyd Wright."

The office of filmmaker Ken Burns, located in a converted barn behind his house in New Hampshire, is festooned with mementos from his documentaries: autographed balls from "Baseball," flags and a bust of Lincoln from "The Civil War," various antique posters. Lately he's been adding architectural keepsakes while doggedly pursuing the controversial and complex subject of his newest piece: Frank Lloyd Wright.

For Burns—who throws himself into his subjects with insatiable curiosity and undeniable enthusiasm—Wright stands alone as the towering genius of American architecture. But the director continues to struggle with the question of whether the architect's personal shortcomings can be justified by his lasting accomplishments. Burns discusses reconciling the artist with the arrogance in the following interview. ("Frank Lloyd Wright" will air on PBS November 10 and 11.)

RECORD: What drew you to the subject matter?

Burns: I wanted to deal with the personality as much as with the art. I had seen a film in 1983 on PBS, a British film, which is probably the best to date on Wright. But it only alluded to his off-screen life. I was curious about [Wright's] overweening arrogance, abandoning his family, the scandals, the tragedies. And I was curious about who this man was who made these remarkable buildings—he's unquestionably the greatest American architect.

RECORD: How did you approach the subject of his flaws?

Burns: The challenge is to maintain a dual interest in the personal life and the work that's created. How do you honor the architectural genius, the novelty and the discovery, and place it in the context of the times and his personal life? On top of it all is a guy who's not afraid to say he's the greatest architect that's ever lived.

You have to come to some decisions as to what the contribution was. If he's not a great man, then everyone would hate him and he's a schmuck. He'd never get away with it. But because he is a great man, it's as if [the transgressions] become an ingredient of the greatness. I still have the question—and the answer is for the viewer to determine—as to whether that behavior was necessary.

Brendan Gill suggests early [in the documentary] that Wright needs to live on the edge, that that's where he found a certain creative fulfillment. At the same time, I'm not sure if the edge has to extend to every kind of aberrant behavior.

RECORD: How did his work come to affect you?

Burns: In every Wright building, every space, you're bombarded with the fact that he breathes life into every gesture, every moment. I could never live in a Wright house—it would be too tiring. He's there. The thing that strikes me is the intentionality of every moment.

A great Wright space is a strange, wonderful combination of intimacy and monumentality. The Guggenheim [Museum in New York] is smaller than you think it will be—it's an intimate space. But then once you're inside this intimate space it feels big. Wright wanted people to be transformed, to be awakened by buildings.

RECORD: How did you go about capturing the feel of Wright's buildings?

Burns: We take time throughout the film to do what I think are exhilarating takes on Johnson Wax, on Fallingwater, and others, so that a layperson can come away from this and say, "My goodness, this is great stuff, it's different from what I [normally] see."

A lot of the impact comes from music. Early on, we realized that, purely coincidentally, a lot of the people we talked to made references to Beethoven. Someone would say, "Well, this building is [Wright's] Ninth Symphony." We even came across a Wright quote about his father telling him that a symphony is an edifice of sound, and that a composer is an architect.

So, we had the idea to use a great deal of Beethoven's work as the soundtrack, and I think a lot of the mood we're able to create—the ability to get inside an image, inside a building—comes from that. Of course, we had a great composer.

RECORD: Who was the bigger jerk, Wright or [infamous baseball player] Ty Cobb?

Burns: That's a good one. I guess Cobb, because it came with a racism as well as an arrogance. It was virulent, and I don't think Wright was. He was a snob, he was an elitist, and he believed his own p.r.

And Wright is not like Picasso—he's not a misogynist. He's a serial monogamist. He abandoned his wife for a woman that he loved—it's not uncommon in history. He was following passion. But let's not forget the damage left in his wake—he did abandon six children, all of whom carried the scars to the grave. His genius goes in one direction [away from his family], and that has terrible consequences.

RECORD: It sounds like you think the misbehavior was worth it in order to have the buildings.

Burns: With anybody who's worth our attention, in the end we're left with the very adult sensibility of needing to tolerate controversy. Did he have to be this way in order to create what he did? That's the question we're left with.

The people that we love the most are not perfect. The Greeks told us that a hero is in fact a flawed individual. When we attempt to find black and white in everything, we're tripped up. When we attempt to tolerate complexity, to welcome undertones, then we're rewarded. That's the great gift of art.

Soren Larson



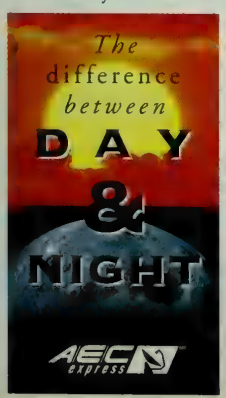
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CIRCLE 33 ON INQUIRY CARD

HOUSTON'S FIRST HIGH-RISE IN YEARS GRABS A SPOT ON MAIN STREET

The 1000 block of Main Street, the physical center of downtown Houston, has been a parking lot since the demolition of the historic Lamar Hotel in 1985. Now, in response to the city's economic rebound and to office occupancy rates that are pushing 100 percent, Century Development has announced plans for a 25-story speculative office tower at this prime location. The building, which will be the first new high-rise in the city center since the mid-1980s, is being designed by Gensler's Houston office.



Century CEO Richard Everett, FAIA, believes the downtown area is ready for a multitenant building with all the latest high-tech amenities, including increased electrical capacity, data prewiring, and flexible air-conditioning systems.

Oversize floor plates of 28,000 square feet are planned for the new high-rise in order to attract larger tenants. Parking for 1,400 cars will be accommodated on the first nine floors above ground level.

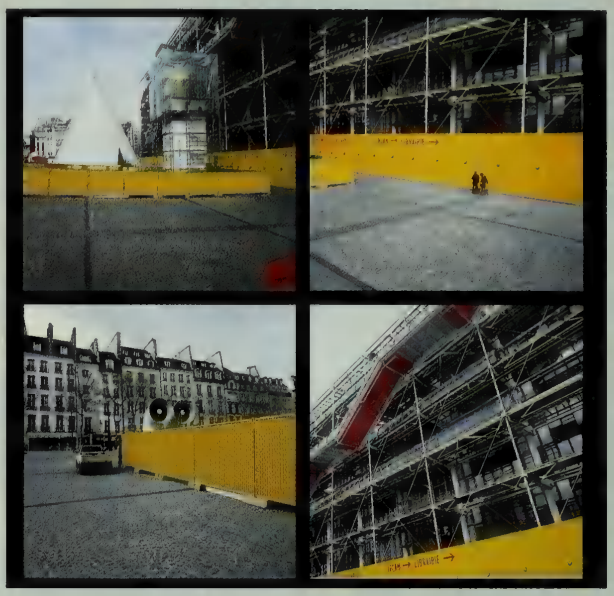
The tower will occupy the northern half of the site, with an attached 10-story structure on the south. This organization not only emulates New York's famous Lever House by Skidmore, Owings & Merrill but also mirrors SOM's First City National Bank—built in Houston in 1960—which sits just across the street.

According to Gensler designer Norman Hoover, FAIA, the project "makes a commitment to a pedestrian-friendly urban environment on Main Street," something of an anomaly for Houston, but a much-needed addition.

The base of the building, in fact, will be given over entirely to pedestrian activities, including a major hub of the tunnel system that connects most downtown buildings with shopping and eating facilities; a bus stop; and retail/restaurant lease space.

Offsets in the design create a graceful vertical emphasis, says Hoover, and diminish the mass resulting from the large floor plates.

While it won't be the tallest building downtown, the new tower will benefit from its location in a pocket of older, lower buildings, where it can establish an identity without having to dominate the skyline like the corporate symbols of the past. *Gerald Moorhead, FAIA*



TRANSFORMING AN ICON **Sometimes the slightest change in appearance can dramatically alter the experience of a landmark building. The Pompidou Center in Paris closed for major reconstruction this spring; the $88 million renovation involves circulation spaces, theaters, and the large entry hall, along with the museum and gallery spaces and the library. Meanwhile, passersby are seeing the site in a new way by following the bright yellow wall that snakes around it.** ***S.L.***

CCA FOUNDER TO LOOSEN REINS; FORSTER NAMED NEW DIRECTOR

Two decades after she conceived it, Phyllis Lambert is loosening her grip on the Canadian Centre for Architecture, the Montreal museum, library, archive, and study center. However, in a move characteristic of her foresight and unwavering control, the 71-year-old Lambert is "establishing the CCA's future trajectory," as she puts it, by appointing scholar Kurt Forster to succeed her as director (effective March 1, 1999) while retaining her position as chair of the board of trustees.

Over the years, Lambert built up the CCA collection to include about 160,000 volumes and tens of thousands of drawings and photographs related to architecture; helped design a new 130,000-square-foot building, which opened in 1989; organized scores of imaginative, generously funded exhibitions and programs; and put in place the scholars' program, the last piece of her original plan.

The CCA has upped the ante for high-quality architectural exhibitions, with shows that display creative scholarship (such as the 1996 reconstruction of five unbuilt projects by Frank Lloyd Wright) and inspire passionate debate (the Peter Eisenman exhibition in 1994, for instance).

Now Lambert is ready for a new phase. In Kurt Forster, she has found a scholar, writer, and educator who is knowledgeable in both architectural history (notably the Renaissance) and contemporary design. Until recently founding director of the Getty Center for the History of Art and the Humanities in Los Angeles, he is now chair of the Department of Art and Architecture at the Federal Institute of Technology in Zurich and head of its Institute of History and Theory.

According to Philip Johnson, who has been close to Lambert, "Lambert's a populist, Forster's an academic perfectionist."

Says Forster, "Architecture is fundamental to our notion of civilization. Interest must be rekindled." He and Lambert believe the key lies in training young people, and both appreciate the cosmopolitan nature of Montreal, as well as its scholarly tranquility. Among Forster's plans: "An exhibition examining how specific works of architecture—historical, recent, and current—result from a set of decisions."

Do Lambert and Forster worry about jousting with a strong-willed counterpart? To the contrary, their excitement is palpable. *Susan Doubilet*

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The $2.5 billion Den Haag Nieuw Centrum (The Hague New Center) project is supposed to change that, giving The Hague big-city allure to match its importance in politics, and attracting business back to its center.

Willem van de Ven, the New Center's overall project manager, also sees it as an opportunity to upgrade The Hague's transportation infrastructure and "to repair the city in areas where nothing has happened in the last 10 or 20 years, or where the wrong things happened." Three buildings have already been built above a freeway that slices through the city center, at least two more are planned, and a portion of a misguided, six-lane viaduct has been demolished.

The project brings together the most prestigious collection of architects ever assembled in the Netherlands, and when completed it will encompass more than 8.5 million square feet of office space, 850,000 square feet of retail space, hundreds of residential units, and new public spaces. At its core is the gleaming white $175 million civic center, designed by Richard Meier & Partners and opened in 1995.

Another major project now rising is De Resident, a $250 million complex of offices, government buildings, retail outlets, and residences. The first two pieces of the development, Michael Graves's Castalia building (below) and Dutchman Sjoerd Soeters' Helicon, were unveiled in July.

The steeply sloping roofs of Castalia's twin 340-foot red-brick towers recall traditional Dutch houses, while Helicon's three identical, 187-foot terraced red-brick blocks pay homage to New York Art Deco. Just a few feet from Castalia, Cesar Pelli's hexagonal 289-foot Zurich tower is going up, capped by a distinctive cupola. *Jim Wake*



FOREIGN PRESS ROUNDUP

LET'S MAKE A DEAL

In a group interview in the July issue of *Architecture + Urbanism* (Tokyo), Austrian architect Wolf Prix of Coop Himmelblau speaks of the experience of those, like himself, who were once considered "paper architects." Prix, whose deconstructivist architecture was long considered unbuildable, has determined that in order to implement radical ideas an architect must not waste all his or her energy in resisting conservative building codes and developers' programs. "You have to do some compromise in order to get through your ideas.... Compromising the concept is not a good way to do buildings, but you have to make a deal sometimes."

MINING FOR IDEAS

The June issue of *L'Architecture d'aujourd'hui* (Paris) chronicles the ecological devastation wreaked by 60 years of giant-scale open-cut mining and air pollution in what has become known as the Black Triangle, a region rich in coal and lignite that lies between Leipzig in Germany, Bohemia in the Czech Republic, and Southwestern Poland. Among several recommendations offered by architects and planners to make the lunar landscape inhabitable again, Michael Sorkin and Andrei Vovk suggest flooding the mines with water to make tourist-friendly villages among a chain of lakes. Meanwhile, mining continues.

LITHUANIAN DEFENSE

In regard to developing a new Lithuanian architecture, Jonas Mikevicius writes in *Arkitektas* (Kaunas) that "having rid ourselves of the illegal Soviet presence in our country...we should guard ourselves against adopting unwanted foreign tendencies." Foreign architects have been grabbing the most visible, in-demand, and lucrative commissions in Lithuania: churches and banks. Meanwhile, Lithuanian architects—who logged no experience designing churches and banks during a half century of Communism—are relegated to designing lower-profile homes and shops.

BON APPETIT

The July/August issue of *Domus* (Milan) featured British artist Damien Hirst's restaurant, Pharmacy, designed by Hirst and Rundell & Associates. With its clinical atmosphere—medicine cabinets line the walls and the stool tops are giant aspirin tablets—Pharmacy has been billed as the shining achievement of the new pop wave and a hip place to eat. Hirst came to fame placing bisected farm animals on display in art galleries.

CONSIDERING STATEHOOD?

In a blurb about an exhibition of Austrian architecture in its August issue, the British monthly *Architectural Review* takes an unpatriotic swipe at its home country. "Austrian culture is, like England's, post-imperial, but perhaps because of its smaller size and population, or perhaps simply because it has long been a potpourri of different civilizations, artistic life in central Europe seems a lot more vibrant than it does in this offshore dependency of the U.S." Among the dozen projects profiled in the issue there is only one by a British architect.

—compiled by David Simon Morton



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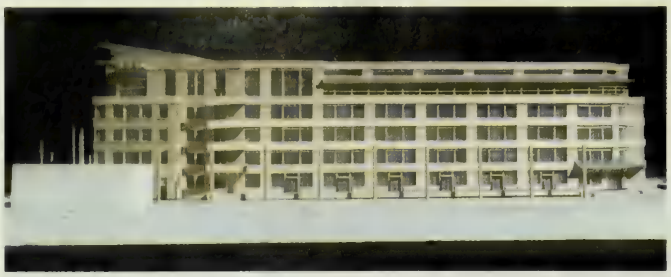
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ARTISTS CATCH A BREAK IN BOSTON WITH SUBSIDIZED LOFT SPACES

Live/work space remains scarce in New England, but a single new building on Washington Street in Boston's scrappy South End will add 99 condo lofts to that city's stock.

Project designer David Hacin, AIA, of Hacin & Associates teamed with Conyngham Associates Architects on the Laconia Lofts, an $18 million, 180,000-square-foot, mixed-use structure with 75 underground parking spaces. "What you don't get in Boston," Hacin says, "is big, open interiors and big windows." By contrast, Laconia Lofts units will be delivered without partitions—although utility kitchens and bathrooms are included.

Seven-foot aluminum windows stud the brick exterior facades, and a zinc-roofed tower, which is characteristic of adjacent factories, marks the residential entrance and distinguishes it from the storefronts on Washington Street.

Gentrification in the nearby historic district of bow-front, brick row houses created a need for the project. Would-be residents seeking housing alternatives in the South End have inflated rents in the converted industrial buildings behind the Laconia Lofts site, pushing the artists who colonized those buildings out of their studios.

In response, a private developer, Jack McLaughlin, proposed these partly subsidized lofts to replace a boarded-up gas station on city-owned land at the intersection of Washington and Laconia Streets—which has been renamed Laconia Way and turned into a pedestrian conduit that runs alongside the new lofts.

Just under half of the Laconia Lofts units have been subsidized for low-income artists. Hacin said he plans to weave residents' artwork into the fabric of the building and that a 1,000-square-foot gallery will be available for their use.

The developer has benefited from the relationship as well, Hacin claims. Having artists in the building gives a "sense of hipness" rare in subsidized housing, he says. Also, the developer is getting "nearly market-rate prices for unfinished units with concrete floors." *Craig Kellogg*

LACK OF FUNDING LAMENTED AT COURTHOUSE DESIGN CONFERENCE

The government's reluctance to replace malfunctioning and bland-looking courthouses dominated discussion at the Third International Conference on Courthouse Design, held in Toronto in September.

The three-day conference, organized by the AIA and Public Works and Government Services Canada, attracted some 700 registrants.

Several panelists suggested that a classical, pre-1920s style of courthouse architecture captured the majesty and dignity of the justice system more enduringly than the streamlined but often inefficient courthouses that followed several decades ago.

The Honorable Wayne L. Peterson, assistant presiding judge of California's Superior Court in San Diego County, described a 1960s-era, three-story-high, three-block-long courthouse in his district as "a long breadbox on its side, nonfunctional, with HVAC problems and full of asbestos…an architectural disaster."

Panelists complained that governments are often reluctant to replace obsolete courthouses like this one for fear of taxpayer backlash and because of an entrenched public works mentality that disdains fresh architectural style.

But there was some optimism. Ontario's Attorney General, Charles A. Harnick, described a $100 million, four-year-long partnership with SHL Systemhouse, Toronto, that will link all the players—from police to courts to correctional institutions—with relevant information on-line. The infrastructure is incorporated in the design of 11 new and renovated court facilities under construction in Ontario, at a cost of $160 million. Attendees applauded this attention to modern technology. *Al Warson*

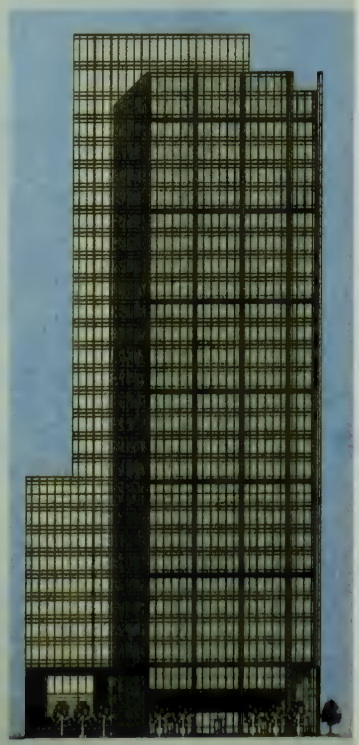
NO SHORTAGE OF PROPOSALS IN CHICAGO **Over the past year, a number of Chicago developers and architects have announced plans for high-rise construction—big news in a town that hasn't seen much office tower development since the mid-1980s.**

But the ballyhoo is somewhat premature. Of the several proposals, none have begun construction. And with a total of 10 million square feet projected, the schemes exceed the demands of the marketplace, making it likely that as few as two or three will actually be erected.

Among the proposed projects are a 70-story structure on Wacker Drive designed by James Goettsch of Lohan Associates for the John Buck Co., and towers for Wacker Drive and South Dearborn Street by Skidmore, Owings & Merrill. DeStefano and Partners has been tapped to work up plans for several projects, including a 50-story building at 300 North LaSalle Street for the Prime Realty Group Trust (with Ricardo Bofill as design consultant), and the 35-story Dearborn Center (right), a venture of the J. Paul Beitler Development Co. and the Prime Group Realty Trust. The latter, which would offer 100,000 square feet of retail space and 900,000 square feet of office space, seems among the more likely to be constructed (see related story, page 174).

The roster may be illustrative of a bit of wishful thinking on the part of Chicago developers. Notes SOM's Adrian Smith, "Most things I know of, whether we're doing them or other people are doing them, are still in the process of trying to find a tenant." Nevertheless, Don Shapiro, senior vice president at J. Paul Beitler, is optimistic that ground will be broken for Dearborn Center in the first quarter of 1999.

Others may be equally confident, but as Chris Slattery, a deputy commissioner in the Chicago Department of Planning and Development, observes, "the proof will be when the steel actually shows up and the caissons start going in." ***Thomas Connors***





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NEWS BRIEFS

The suit fits Another A/E firm has been nailed for wrongful use of design software. Engineering Design Group (EDG), based in Washington, D.C., has agreed to pay $324,000 to settle a lawsuit filed by the Business Software Alliance. The BSA had shown up at EDG's door in the company of U.S. Marshals to conduct a court-approved audit; what they found were unlicensed copies of software programs published by Autodesk and Microsoft, both BSA members. Earlier this year, New York's Milo Kleinberg Design Associates paid the BSA $150,000 to avoid litigation after similar accusations.

Joining the service The Federation Employment and Guidance Service, a voluntary, not-for-profit human services organization, has tapped Montroy Andersen Design Group to design its new location on Hudson Street in Manhattan. To address the unusual needs of FEGS clientele, many of whom are troubled individuals seeking employment guidance, Montroy will use various colors and materials as design elements to distinguish the building's different services and create a welcoming ambiance. The design firm is also using its unique project management Web site, in which project teams and clients—who have been assigned their own accounts and passwords—can monitor the project 24 hours a day. Schedules and documents can be updated from remote locations.



Helpern is designing the first major extended-stay housing in New York.

Going green The Naval Facilities Engineering Command (NAVFAC) has become the first federal agency to adopt sustainable design principles for its facilities and infrastructure. In all future design and construction, the NAVFAC expects to adopt the Green Building Rating System under development by the Energy Department.

New for New York Extended-stay housing, which mainly serves business travelers staying five or more nights, is unheard of in New York City. But now Helpern Architects is designing two facilities in Manhattan for Homestead Village, an Atlanta developer that operates extended-stay lodgings around the country. The new projects, both in Midtown, will contain in-room kitchens, workstations, full-size closets, and up-to-date electronic capabilities. Developers are also betting on extended-stay in the New York suburbs. In New Rochelle, Sullivan Architecture has designed a 115,000-square-foot, 123-room facility due to open late next year.

Learning curve More than 100 forums were held across the country on September 8—including 11 events led by AIA members—to call attention to the need for school modernization and new school construction. According to the Department of Education, new records have been set for three straight years in terms of the numbers of children attending U.S. schools.

Sprint for home Communications giant Sprint is undertaking what it



calls the largest ongoing construction project in the U.S. Once it is completed, the Sprint World Headquarters Campus in Overland Park, Kansas, will comprise 3.9 million square feet and accommodate 14,500 employees in 18 office buildings. Five architectural and four engineering firms, all based in Kansas City, are collaborating on the project, which features a neoclassical design with traditional brick exteriors. All the buildings are low-rise—with a maximum of five stories—and about 60 percent of the site will be green space, including a seven-acre lake.

Le Corbusier Nouveau The Maison Radieuse, a groundbreaking public housing project designed by Le Corbusier and built in 1955 near Nantes, France, has been showing dangerous signs of decay. As a result, the building's administrators, Loire Atlantique Habitations, have embarked on a restoration plan—a complicated one, because of the difficulties involved in replacing worn-out or damaged concrete. It is hoped that the techniques developed in this project will be beneficial in restoring other concrete Le Corbusier works.

Saintly designs The Archbishop of Barcelona has proposed the beatification of Antonio Gaudí, the Spanish architect best known for the vast (and unfinished) Sagrada Familia Cathedral in Barcelona. Gaudí spent the last 40 years of his life working on the cathedral; he died in an accident in 1926. The Archbishop cited his "intimate and spiritual life."

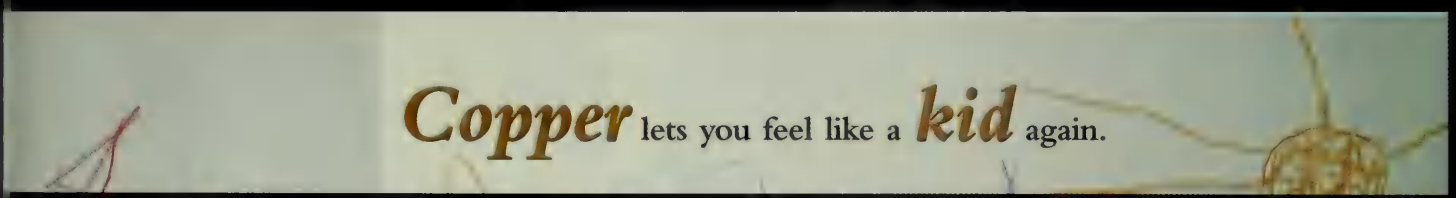
Art matters Antoine Predock has been retained to design an arts complex on the Colorado College campus. The $16 million, 60,000-square-foot center is slated to house a theater, the school's film and video programs, a recital hall, gallery space, faculty offices, and high-tech classrooms. In other arts news, Richard Gluckman has won a competition to design the Austin Museum of Art. Robert Venturi had won the commission in the 1980s, but the project never went forward. When it was revived recently, the process started all over with a new competition. In California, the Stanford University Museum of Art's renovation and expansion, designed by Polshek and Partners, is nearing completion. The redone original building, new gallery wing, and new sculpture galleries will open in January.



Work is being done on the facade of Le Corbusier's Maison Radieuse.

Sky high On October 1, after a period of homelessness, the Skyscraper Museum opened its new quarters at 16 Wall Street in New York with an exhibition called "Building the Empire State." The exhibition chronicles how the Empire State Building was designed and constructed in just 20 months.

Next act Dutch architect Erick Van Egeraat has been chosen by England's Royal Shakespeare Company to design its new home in Stratford-on-Avon. Plans aren't finalized, but the company would like a new building—if it can secure $80 million in grants related to national lottery profits and an additional $50 million or so in private donations. ■



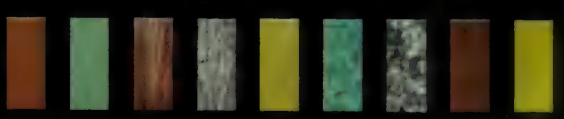
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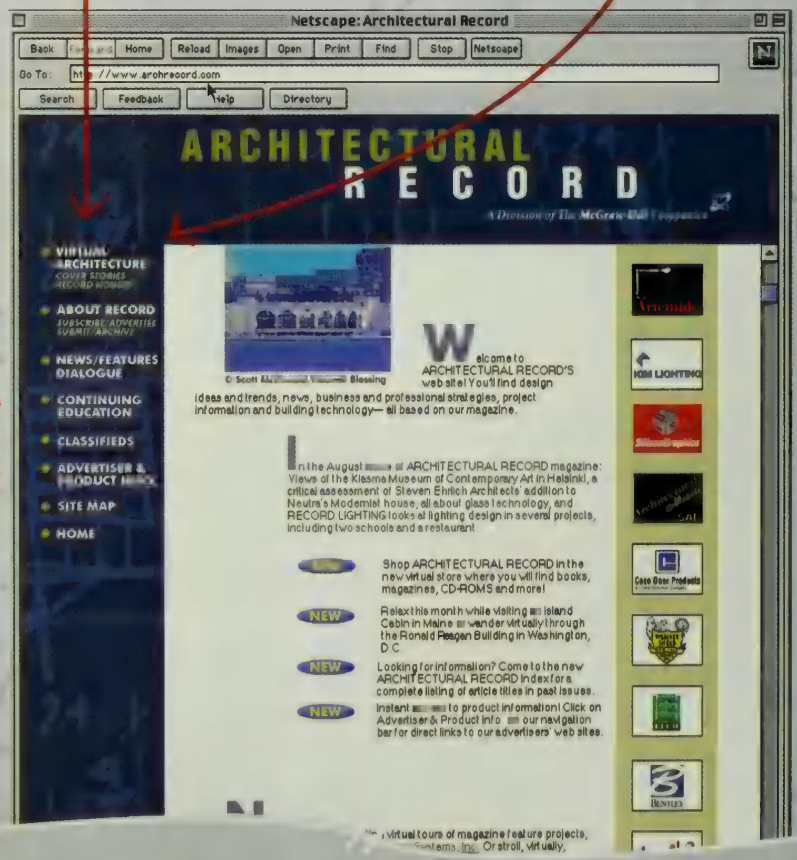
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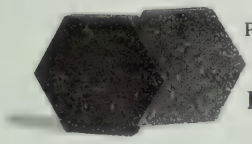
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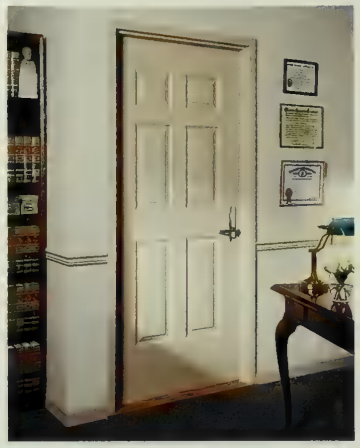
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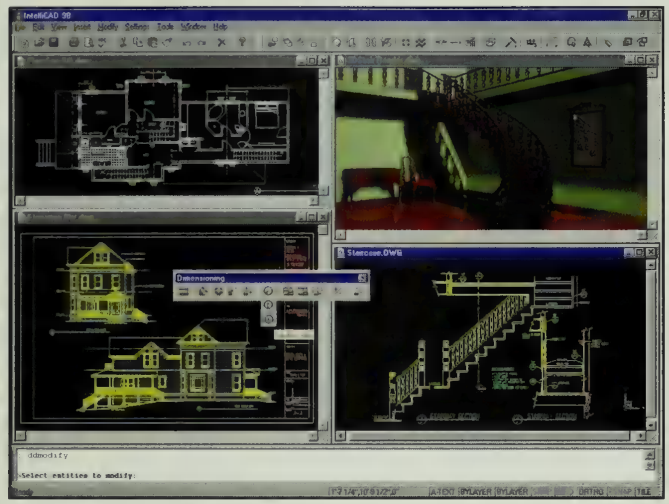
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DATES EVENTS

Calendar

Fountains: Splash and Spectacle
New York City
Through October 11
This exhibition elucidates the role of fountains—and water as a design force—in defining urban space in Europe and America, with examples ranging from the Renaissance to the present. Cooper-Hewitt National Design Museum. 212/849-8300.

Frank Lloyd Wright and the Living City
Weil am Rhein, Germany
Through October 11
The most comprehensive exhibition in Europe of Wright's work to date focuses on the architect's schemes for Broadacre City, which attempted to erase the dichotomy between city and country. Vitra Design Museum. 011/49/7621/702-33-51 or visit www.design-museum.de.

Walker Evans: New York
Los Angeles
Through October 11
While Evans is best known for his Depression-era photographs of the American South, this exhibition reveals the full range of his work as a New York street photographer, including some of his earliest and most abstract compositions. J. Paul Getty Museum. 310/440-7360.

Do Normal: Recent Dutch Design
San Francisco
Through October 20
This exhibition of works by Dutch designers focuses on the centuries-old design consciousness that pervades every aspect of the country's culture. San Francisco Museum of Modern Art. 415/357-4000.

Architectural Fragments: The Work of Lisa Bennett
Washington, D.C.
Through October 23
On display are 31 enigmatic drawings and paintings that focus on space and form. AIA Headquarters Gallery. 202/638-3105.

The Design and Building of Girard College
Philadelphia
Through October 23
Surviving entries in the 1832 design competition for the college, the first architecture competition to attract nationwide attention, are on display, as well as drawings of the construction of the winning entry, completed in 1848. Founder's Hall. 215/787-2601.

Martin Lewis's World: Cityscapes on Paper
New York City
Through October 25
An exhibition of the artist's prints depicting New York City from 1916 to 1947. Brooklyn Museum of Art. 718/638-5000.

Manchester: A Neighborhood Sketchbook
Pittsburgh
Through October 25
This exhibition of photographs, maps, and architectural drawings inaugurates the Pittsburgh Neighborhoods Project, an exploration of the city's rich diversity. Heinz Architectural Center, Carnegie Museum of Art. 412/622-3131.

Under the Sun: An Outdoor Exhibition of Light
New York City
Through October 25
An exhibition of solar-powered installations, including commercial products, experimental prototypes, and commissioned designs. Cooper-Hewitt National Design Museum. 212/849-8300.

Architecture for Children
Chicago
Through October 30
An exhibition of projects for children—schools, day-care centers, gymnasiums, and museums—by Chicago architects. Art Institute of Chicago. 312/443-3600.

The Havana Project: Architecture Again
Vienna, Austria
Through October 31
Visions of a future Havana are featured in this exhibition, with projects by Coop Himmelblau, Thom Mayne, Eric Owen Moss, Carme Pinós, Lebbeus Woods, and C.P.P.N. Austrian Museum of Applied Arts. 011/43/711/36-233.

Reconstructing the Aluminaire House
New York City
Through October 31
An exhibition celebrating Lawrence Kocher and Albert Frey's innovative 1931 structure, which is being restored and relocated to New York Institute of Technology's Central Islip campus. Architectural League of New York. 212/753-1722.

The Triumph of Grand Central Terminal
New York City
Through November 11
A multimedia exhibition that includes photographs documenting the soon-to-be-completed restoration of Grand Central; historic photographs and news clippings; a video installation of views from the terminal's "celestial ceiling"; and time-lapse photography. Municipal Art Society. 212/935-3960.

Sculptors Engaging 20th-Century Building
New York City
Through November 14
Sculptures that explore architectural themes by such artists as Peter Boyton, Jean-Marc Bustamante, Peter Dudek, and Rita McBride. Times Square Galleries of Hunter College. 212/772-4991.

Living-Reading: Rem Koolhaas and Bruce Mau
Vienna, Austria
Through November 16
A two-part exhibition centering on the creators of the 1995 publication *S, M, L, XL* features works by Dutch architect Rem Koolhaas and his firm, the Office for Metropolitan Architecture, and by graphic designer Bruce Mau. Architektur Zentrum Wien. 011/43/1/522-3115.

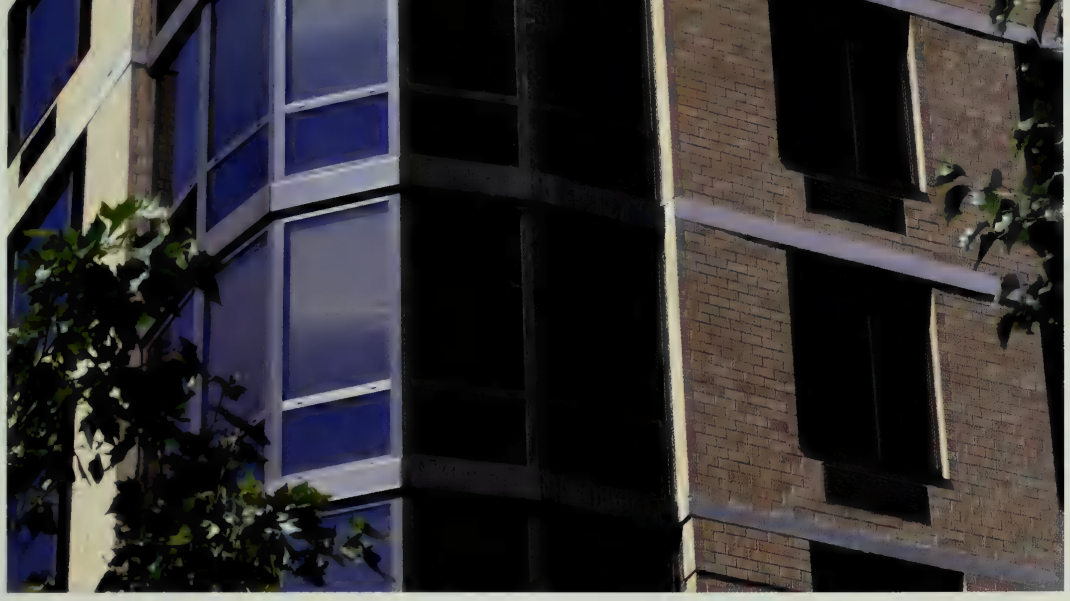
Equal Partners
Northampton, Mass.
Through December 13
A celebration of male/female professional collaborations, featuring the work of 15 American firms founded and run jointly by men and women, including Arquitectonica, Asymptote, Hodgetts + Fung, and Tod Williams Billie Tsien Associates. Smith College Museum of Art. 413/585-2760.

New Ways of Revitalizing the American City
Washington, D.C.
Through January 3, 1999
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

La Presence des Objets: Gaetano Pesce
Montreal
Through January 3, 1999
Furniture, objects, and models and plans of recent projects by the architect and industrial designer. Musée des Arts Décoratifs de Montréal. 514/284-1252.

Robert Adam: The Creative Mind
Washington, D.C.
Through January 3, 1999
An exhibition of work by the 18th-century Scottish architect, demonstrating his process of design from conception to final presentation. The Octagon. 202/638-3105.

Bechtel's First Century
Washington, D.C.
Through January 4, 1999
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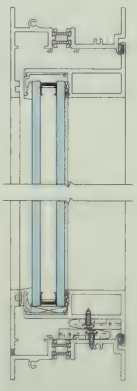
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lighted "megaprojects" include the Hoover Dam, San Francisco's rapid transit system, and the Channel Tunnel. National Building Museum. 202/272-2448.

Tensions in Architecture
New York City
Through January 5, 1999
An examination of the extraordinary developments in the materials and technology of tensile structures. Material ConneXion Gallery. 212/445-8825.

Designing the Disney Theme Parks
New York City
Through January 10, 1999
"The Architecture of Reassurance" examines how Disney attractions are conceived, planned, and built. On display are 200 plans, drawings, paintings, and models from Disney archives, many of which have never been publicly displayed. Cooper-Hewitt National Design Museum. 212/849-8300.

All Wright: The Dana-Thomas House
Chicago
Through January 31, 1999
An exhibition showcasing the most complete and best-preserved example of Frank Lloyd Wright's early Prairie houses. Chicago Architecture Foundation. Call 312/922-3432 or fax 312/922-0481.

Louis Comfort Tiffany at the Metropolitan Museum of Art
New York City
Through January 31, 1999
Nearly 100 Tiffany works from the museum's collection, including windows, lighting fixtures, and objects, are featured. The full-scale entrance loggia from Tiffany's Long Island estate is also on view. Metropolitan Museum of Art. 212/570-3951.

Marion Mahony and Walter Burley Griffin
Sydney, Australia
Through May 2, 1999
An exploration of the professional and spiritual journey of Mahony and Griffin, from their years in Wright's office at the turn of the century through their work in Australia and India in the 1920s–30s. Powerhouse Museum. 011/61/02/217-0111.

Chicago Design Show
Chicago
October 9–11
This year's contemporary furnishings exhibition and sale features Designer on Call, a complimentary service for consumers seeking advice from interior designers. Merchandise Mart. 312/527-4141.

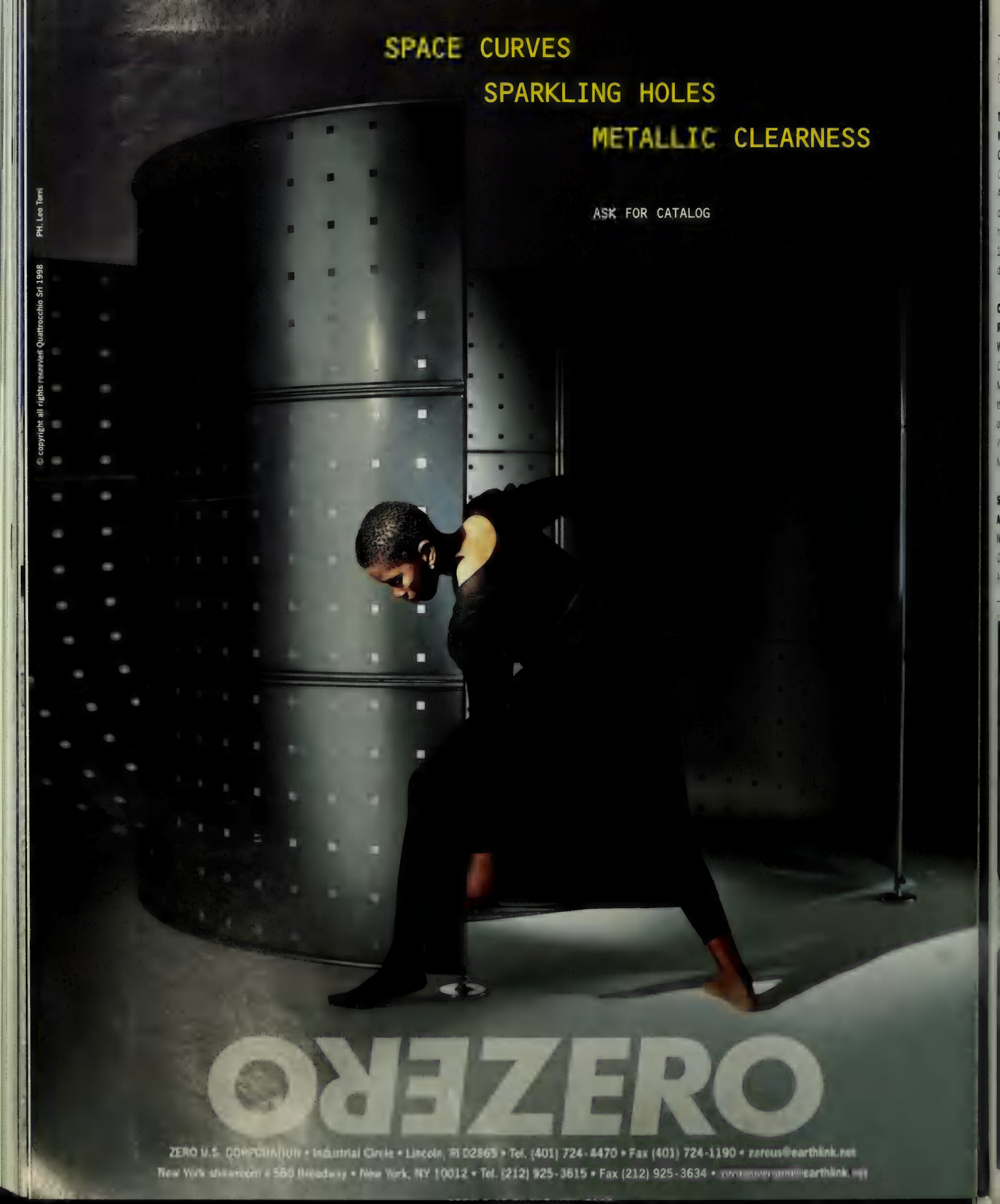
George B. Post: Great American Architect
New York City
October 13–January 10, 1999
Among the works featured in this exhibition of the late-19th- and early-20th-century architect are renderings of the long-demolished Equitable Life Assurance Society (the first building to use elevators) and the Western Union Building (the first to reach 10 stories). New-York Historical Society. 212/873-0509.

Premises: Invested Spaces from France, 1958–98
New York City
October 13–January 11, 1999
An exhibition of visual arts, architecture, and design that underlines the relationship between the artist/architect and the constructed environment. Included are works by Yves Klein, Jean Dubuffet, Daniel Buren, Le Corbusier, and Jean Nouvel, among others. Guggenheim Museum SoHo. 212/423-3500.

1998 Professional Design-Build Conference
Chicago
October 14–16
This year's conference, cosponsored by the AIA and the Design-Build Institute of America, will also feature the Integrated Products and Services Show and the announcement of winners of the National Design-Build Awards Competition. Palmer



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The American Dream by Mail Order
Chicago
October 15–December 31
An exhibition exploring the history of Sears, Roebuck & Co. catalog houses built between 1908 and 1940. Chicago Architecture Foundation. 312/922-3432.

City Satire: The Cartoons of Roger K. Lewis
Washington, D.C.
October 15–February 28
More than 100 cartoons satirizing the state of architecture and urban design, originally published in the *Washington Post*. National Building Museum. 202/272-2448.

Speaking of Architecture: A World View
Northampton, Mass.
October 17
A symposium that explores how architecture serves, both culturally and aesthetically, to enhance the lives of individuals and communities. Speakers include Vincent Scully, Samuel Mockbee, and Helen Searing. Smith College Museum of Art. 413/585-2760.

Japan 2000: Kisho Kurokawa
Chicago
October 17–January 3, 1999
A major retrospective of the work of Japanese architect Kisho Kurokawa, from his early Metabolist projects to his current addition to the Van Gogh Museum in Amsterdam. Art Institute of Chicago. 312/443-3600.

Architecture Principe: The Oblique Function
Santa Monica, Calif.
October 17–January 10, 1999
A survey of work by Groupe Architecture Principe, formed in 1963 by Claude Parent and Pail Virilio, who opposed the concept of Euclidean space. Form Zero Architectural Gallery. 310/450-0222.

Annual Conference on Contaminated Soils
Amherst, Mass.
October 19–22
Representatives from government agencies, the military, industry, and the environmental community attend this annual conference on soil clean-up. University of Massachusetts at Amherst. Contact Denise Leonard at 413/545-1239 for more information.

Metalcon '98
San Diego
October 20–22
The annual convention of the metal construction industry highlights the latest products and services. San Diego Convention Center. Call 617/965-0055 or visit www.metalcon.com for information.

FEDCON/North American Construction Forecast Conference
Washington, D.C.
October 22–23
At FEDCON, government agencies present their 1999 construction budgets and plans and provide updates on new regulations. At the North American Construction Forecast conference, leading economists and analysts present their forecasts for the construction industry. Ronald Reagan Building and International Trade Center. Contact Lori Riegert, CMD Group, 800/283-4699, for more information.

ASHRAE Indoor Air Quality and Energy Conference '98
New Orleans
October 24–27
Sponsored by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), this conference is meant to help commercial building designers, contractors, and building owners achieve acceptable indoor air quality and energy efficiency through proper application of ASHRAE standards. Radisson Hotel. Call 404/636-8400 to register.

(continued on page 212)



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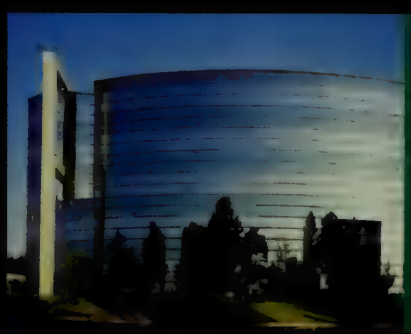


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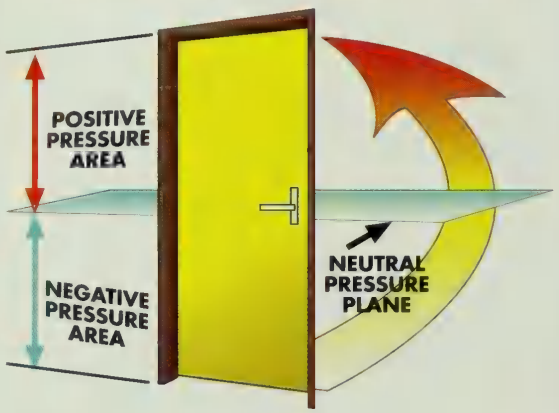
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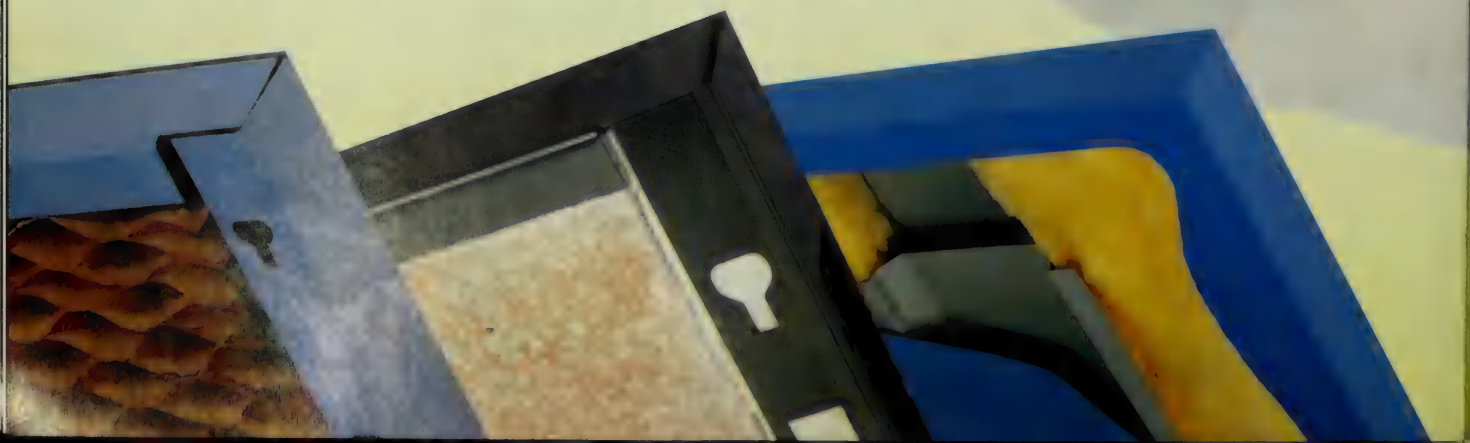
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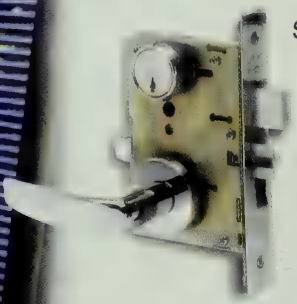
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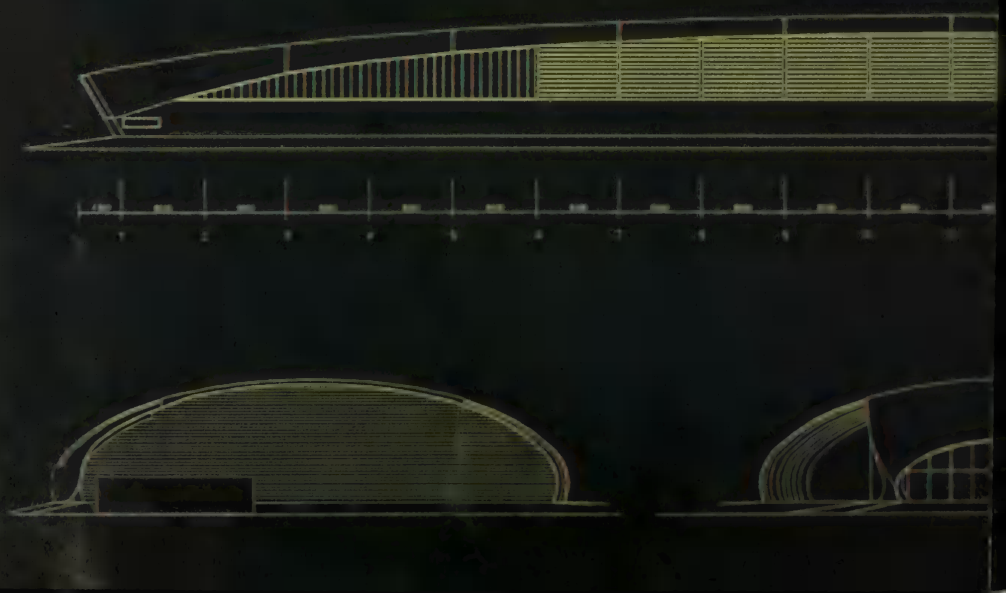
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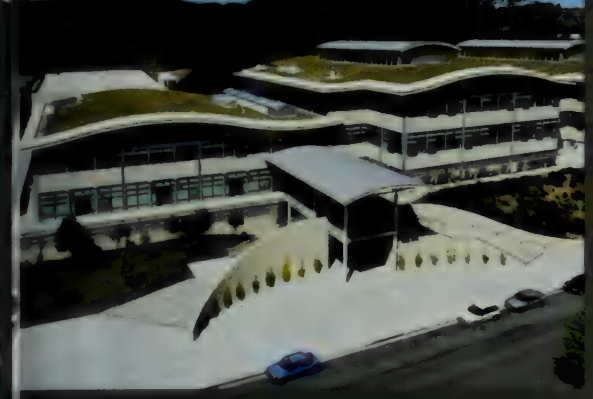
Business Week

Architectural Record Awards

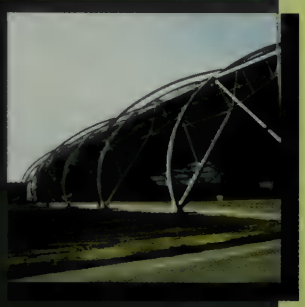
Using Architecture to find Solutions for Business











by James S. Russell, AIA

It is conventional wisdom that architecture is a frill, something to be added if there's someone to impress. The second annual Business Week/Architectural Record Awards put the lie to that notion in intriguing ways. Among the winners there is little that is spectacular or even overtly stylistic. Instead, although some projects display assertive designs, there is much that is inventively prosaic among the winners. All show how architectural creativity can be applied to pragmatic needs.

What was the common thread among such a disparate group of winners? "There was an appropriateness," responds architect Rodolfo Machado, of Boston-based Machado and Silvetti Associates, one of the jurors. In this he sums up opinions offered by others. "The winners were remarkably well tailored to their purpose," he continues. "All the architects showed a deep understanding of the image needs and the requirements for the budget." These successful projects also offer a variety of other benefits, including employee retention and promotion of cultural and environmental values.

Competing for people

What could be more timely, in this era of labor shortages, than retaining and attracting valued people? In the competitive world of fashion, Gap Inc. recognized that its new building in San Bruno, California, could help keep competitors from plundering valued staff. The facility provides an impressive number of amenities: a fitness center with lap pool, a café opening onto a terrace, a jogging path, windows that open. But the spaciousness (floor-to-floor heights are a generous 15½ or 20-plus feet) and the omnipresence of daylight suggest an informal atelier, a place where colleagues can readily find each other to launch an idea or hash out a dispute.

The New York Times Company had a tougher challenge: building a new, more automated plant meant laying off a considerable number of long-time employees. How to retain the best people while developing a less contentious long-term relationship with unions? Build a workplace that staff would be proud to work in, and close a decades-old printing facility where ancient presses clattered in the depths of cramped subbasements. "There's such a palpable difference at College Point," says David Thurm, executive director of project development. Not only is the project aesthetically pleasing and flooded with daylight, but electronic scoreboards throughout the facility keep everyone abreast of the current status of production. "To me, a large part of what it represents is the physical manifestation of a new relationship," adds Thurm.

Futures By Temps, which finds the talented people that businesses seek, took the unusual step of locating its facility in a high-traffic shopping mall. The company recognized that moving a bunch of desks and tables into a storefront was not enough. It needed to do something to lure the best people. That's when the company turned to Adamstein & Demetriou Architects. Since Futures By Temps didn't have a "product" to display, the architect used appealing design to sell the idea of "opportunity."

Conveying values, not just image

This year's winning buildings helped their companies convey identity. In the old days, high-design corporate facilities were intended to impress or to convey solidity and longevity. Now buildings advertise a company's values. The serene minimalism of Osho International's offices in New York City convey the Zen spiritual ideals of the book, audio, video, and multimedia projects the company undertakes. "The space represents who we are," says Klaus Steeg, Osho's president. "It supports the idea of the business and communicates it to [customers]." Indeed, he continues, the

company's clients are so taken with the space that they often ask to meet at Osho's offices rather than their own.

Tilt-up concrete slabs and their metal supports leave little doubt what business the K. J. McNitt Construction Company is in. The contractor calls Oklahoma City architect Rand Elliott's design "a living illustration of the precast-concrete construction process."

Architects Polshek and Partners shaped the New York Times Printing Plant to create a sculptural billboard readable from an adjacent highway, conveying the once-novel idea that production is something the company is proud of and wants to show off.

Residents of River Falls, Wisconsin, were pleased when QMR Plastics chose to locate in their town, helping to diversify the local economy. They were also pleased by Julie Snow's design for the factory, which does more than present a distinctive and attractive face to cars passing on the nearby highway. By including native prairie grasses and flowers and creating a retaining pond on site, the design reduces the facility's impact on the local environment.

Some of this year's Business Week/Architectural Record Award winners used the design process to make facilities that would, in some important way, help them "walk their talk." Osho's facility is remarkable in part because its tranquility is in such dramatic contrast to the noisy hustle of midtown Manhattan. Unions and management have been famously contentious at the New York Times. The design of their new plant is as much a statement about a consultative process (over 300 people were involved in the design at one point or another) as it is a container for printing presses. Seemingly trivial process questions were posed, then answered with often startlingly improved efficiencies. For example, a special mezzanine was built to hold a device that temporarily stores early-printed newspaper sections. It's rare to even consider placing any process above the ground floor, says the Times's Thurm. But it saved several thousand linear feet of expensive, high-maintenance conveyor belts.

IN THE OLD DAYS, CORPORATE FACILITIES WERE DESIGNED TO IMPRESS OR CONVEY SOLIDITY. NOW BUILDINGS ADVERTISE A COMPANY'S VALUES.

Whither the "alternative" workplace?

Projects in which the facility was designed to support some fundamentally new way of working were fewer this year. The most transformative project proved to be, of all things, a waste transfer station in Holland. Not only do its sensuous curves make the sorting of trash an almost appealing notion, the building itself is intended to be literally transformed once the landfill it serves is full. The structure's long spans can adapt to a community recreation center or an auditorium. As in America, few communities want such a facility in their backyard, and the appealing design went a long way in winning community acceptance.

The awards jury focused on a few projects where the clients were less concerned with creating new or alternative workplaces. In these, the companies used design to make very straightforward, publicly understandable statements about themselves. Little money was spent at Praxair, at QMR, or at K. J. McNitt. At Praxair, though, the detailing of the translucent ceiling and exposed ductwork conveys a palpable concern with quality. Juror Charles Gwathmey especially appreciated such low-budget exercises: "They weren't automatic. They were much more inventive and interesting than many of the large projects we saw."

It is notable that the Dutch waste transfer facility was one of three industrial projects chosen as winners. If this year's awards program proves indicative, industrial building design may be entering a new golden age. There are similarities today to the early decades of the century, when Albert Kahn helped carmakers find suitable architectural expression for fast-evolving mass-production systems [see also Building Types Study 761, May 1998, page 199]. Not only are industrial processes changing rapidly, but more companies are recognizing that careful attention to design pays off.

The winners challenged conventional wisdom in other ways. Businesses can supposedly locate anywhere these days, but a number of winners thought long and hard about where they wanted to be. Futures By Temps was so convinced of the rightness of its idea that it overcame the reluctance of mall management to rent to a "nonretail" tenant.

Osho might have chosen a tranquil exurban locale, but Steeg says it was important to be in the midst of the major publishers with which Osho deals, so it made more sense to set up shop in midtown Manhattan. Osho is in one of New York's grand 1920s towers, which, with their slim shafts and small floor plates, are aesthetically admired but often thought romantically passé in this era of bulky, deep-floor skyscrapers. Steeg liked the space because, with windows on three sides, it offered a quality of light he couldn't obtain in newer, thicker buildings.

Let the sun shine in

Although in the past, windows may have been seen as just a nicety—not doing anything useful—inventive use of daylight was common among the winners. It's hard to imagine Praxair without that big wedge-shaped skylight. Sunlight permeates the manufacturing floor at the QMR Plastics facility as well. The appealing light and views are key to drawing and retaining valued staff, who might otherwise prefer a more urban setting. Daylight at the New York Times Printing Plant helps press operators evaluate the quality of the printed product, while skylights bathe ■ cafeteria and break areas with filtered sun. At Gap Inc., the ubiquity of sunlight, along with high ceilings, creates an appealing environment even for those who do not get windowed private offices.

Environmental design strategies are often seen as statements about corporate citizenship rather than as methods that by themselves can enhance the way business is done. The garbage transfer station in the Netherlands actually reconceives the idea of a trash dump, making its processes visible to the community while at the same time screening and treating its noxious aspects. (It includes systems for recycling and processing the gases and water emitted by the landfill rather than just containing them.) In incorporating environmentally benign materials, daylight, and natural ventilation, Gap Inc.'s design reinforces the corporation's support for healthy living and offers a more thermally and visually comfortable work environment, which has a positive impact on productivity.

While recognizing excellence in design for business, the awards program tries to pass along the winners' experience to others. Even the jurors say they learned a great deal. "Sitting around a table with other businesspeople, I heard much that I hadn't thought of," comments Michael Basserman, chairman of Mercedes-Benz of North America. "We, ourselves, are thinking about a new home-office building in the U.S. [The awards program] confirmed what we were thinking, that you can't build a building for a single purpose. Markets and companies and purposes change, and you need adaptable environments." Indeed, adapting to rapid change ought to keep things interesting over the coming years. ■

JURORS

Michael Basserman *Chairman and CEO, Mercedes-Benz of North America*
Wendy Evans-Joseph *Wendy Evans Joseph Architect*
Sherri Geldin *Director, Wexner Center for the Arts*
Charles Gwathmey *Gwathmey Siegel & Associates Architects*
Rodolfo Machado *Machado and Silvetti Associates*
John O. Norquist *Mayor, City of Milwaukee*
Olli Pekka-Kallasvuo *Executive Vice President, Nokia Telecommunications, Inc.*
Charles Rose *Thompson + Rose Architects*
Ian Schrager *Principal, Ian Schrager Hotels, Inc.*
Laurinda Spear and Bernardo Fort-Brescia *Arquitectonica International*
Gerald Taylor *CEO, MCI Communications*

COMMENTS

"[It's an example] where the client went to the architect for a solution. The designers were real partners in demonstrating a business plan and [turning] a mission statement into the physical embodiment of what they were trying to accomplish." **Sherri Geldin**, *on Futures By Texas' prototype store*

"The newspaper had a choice of where to be located. And instead of being in an office park, away from the customer, they chose to be on a busy highway and make the building a statement about the newspaper and its commitment to architecture." **Bernardo Fort-Brescia**, *on the New York Times Printing Plant*

"It merges the design with the narrative of the event." **Charles Rose**, *on the McNitt Building*

THE PROGRAM

Good architects have always understood the powerful role design can play in making businesses more successful. From helping a client with its strategic vision and master planning its facility needs to creating individual workstations that help employees be more productive, architects can directly affect a company's position in the marketplace, its ability to attract and retain the best talent, even its bottom line. Getting the word out, though, has never been easy. While architects can always blow their own horns, such talk is usually perceived as self-serving and less than totally reliable. The Business Week/Architectural Record Awards program, presented in conjunction with the American Institute of Architects, offers architects and their clients a more authoritative venue for showcasing the effectiveness of their collaborations. Juried by business leaders, designers, public officials, and people involved in the building process, the program is anything but a beauty contest. Entrants must submit a project mission statement and business plan, and explain how the project fits into the organization's overall plans. Additionally, entrants must provide detailed descriptions of measurable results.

In evaluating projects, jurors ask a series of questions. What did the client want? How did the architect provide it? How did the architectural solution enhance a company or institution's stated goals? In just its second year, the awards program attracted more than 210 entries, up from last year's 153 submissions. Projects come from both the public and private sectors and from around the world. They are large building complexes and small office spaces. They are new construction and imaginative renovations. The only requirement is that they be completed no more than three years ago. Unlike many other competitions, the Business Week/Architectural Record Awards program does not expect its jury to do its work in one day. Indeed, the jury meets on at least three different occasions—discussing the goals of the program, evaluating entries, then narrowing the field down to a small group of projects, each of which is visited by at least one juror. Only after site visits and interviews with clients and end users do the jurors report back to the full jury and vote on the final winners. It is an exhaustive process.

An important result of this process is credibility. When top executives of some of the most important corporations in the world, along with elected officials and leading architects, agree that a project is an example of good design being good business, you can be sure they're not just picking pretty faces.

Winners are published here and in the November 2 issue of *Business Week*. Because each magazine develops its own coverage of the material, we encourage you to read about this year's winners in both publications. After all, the most important message of the program is the need to look at design through different sets of eyes—client, user, shareholder, architect, neighbor, concerned citizen. *Clifford A. Pearson*

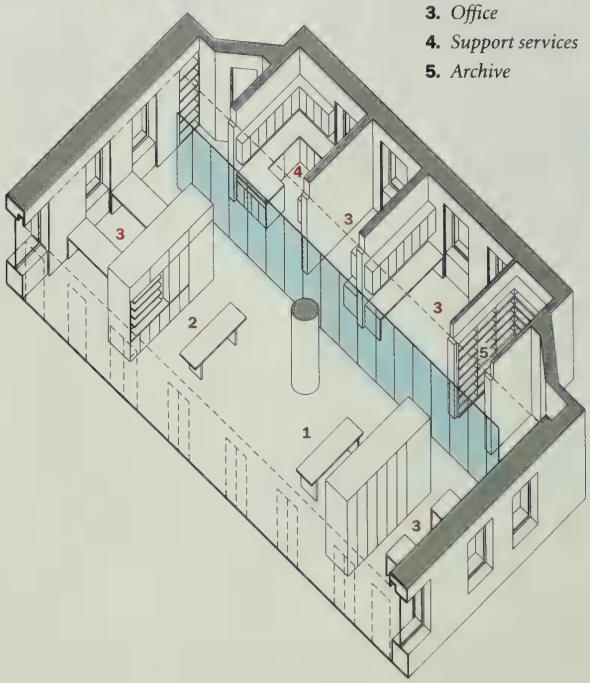
NEW OFFICES FOR OSHO INTERNATIONAL KEEP CLIENTS COMING BACK FOR MORE.

The design challenge was "to create a sense of spaciousness and silence that says what our product is," explains Klaus Steeg, president of Osho International, a company that produces books, videos, and tapes based on the teachings of an Indian philosopher and mystic who called himself Osho. Rising to the challenge, architect Dan Rowen designed a 2,500-square-foot office that captures the meditative spirit of the client's products. Extensive discussions with the key decision makers on the client's staff and close collaboration during the design process allowed the architect to explore alternative ways of organizing the office. As a result, the conference table and reception desk share a common central space that serves as the serene hub of the plan, leaving the line between public and private areas purposely vague.

"The client wanted a place that felt like a beautiful loft, not an office," says Rowen. So the architect brought daylight into the central space, used uninterrupted vertical surfaces, and hid file drawers and records behind elegant cabinets. The most dramatic feature in the office is a wall of 9-by-3-foot glass panels that are acid-etched on one side and clear on the other. A film between the two layers of glass makes the clear side reflective and gives the other side a diaphanous, translucent look.

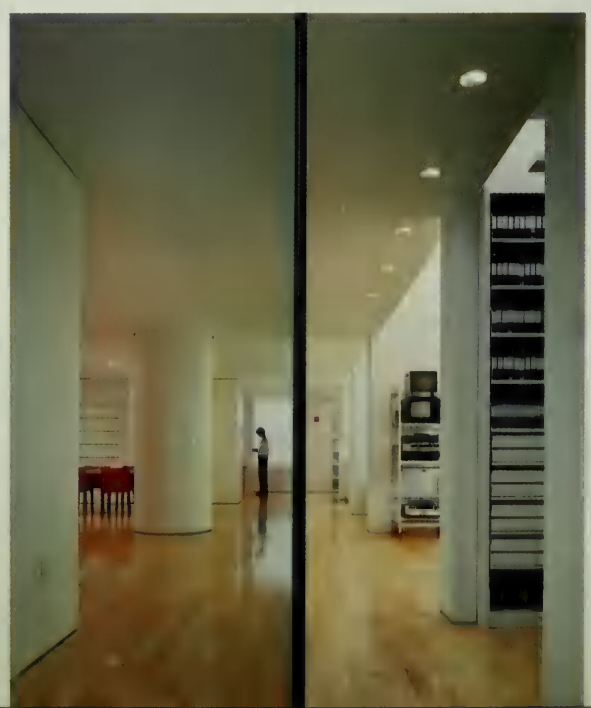
Having moved to New York City to increase its profile in international publishing, Osho wanted its offices to project the image of a company that is both contemplative and dynamic. Rowen's use of clean lines and modern materials has accomplished the task, says Steeg. In fact, Osho's clients like the space so much they often request that meetings take place there rather than in their own offices. The budget for the project (including fees and furnishings) was less than $750,000. *C.A.P*

1. *Reception*
2. *Conference*
3. *Office*
4. *Support services*
5. *Archive*



Project: *Osho International Offices, New York City*
Client: *Osho International*
Building type: *Corporate offices*
Award category: *Private sector, under $1 million*
Key players: *Osho International—Klaus Steeg, president; Daniel Rowen Architects—Daniel Rowen, AIA; Ambrosino DePinto & Schmieder (engineers); Fisher Marantz Renfro Stone (lighting); Sweeney Construction (general contractor)*

"It's a wonderful space. It's very, very minimalist, and the philosophy of the company and many of the employees is reflected in and enhanced by the architecture.... [The central reception/conference room] is a luminous void within the project."
Juror Charles Rose











"The collaboration between architects and client was very strong and constant. The CEO was directly involved in selecting the architects and in overseeing the process. He met with them once a month and participated in the decision making."
Juror Rodolfo Machado



BUILDING IT GREEN, GAP INC. CREATES AN ATTRACTIVE, HEALTHY PLACE TO WORK.

The first office complex that Gap Inc. commissioned and built for itself, at 901 Cherry Street in San Bruno, California, embodies many of the values that the fast-growing apparel company tries to project—including a commitment to its employees and to the environment. "We were looking to create a great place to work," explains Maria Moyer-Angus, senior director of environmental affairs and energy management at Gap Inc. The company also wanted to apply some of what it had learned from its stores in terms of using environmentally sensitive building products and systems, says Moyer-Angus.

The 195,000-square-foot building offers the 600 employees who use it workstations that are never more than 30 feet from daylight, as well as amenities such as a cafeteria and a full-service fitness center with lap pool. The building's large footprint is broken down into three sections, each organized around a skylighted atrium. Designed in collaboration by William McDonough + Partners, Gensler, and Gap's own design team, the building incorporates a number of environmentally sensitive elements including roofs planted with native grasses, wood veneer harvested from ecologically managed forests, low-toxicity paints and adhesives, and formaldehyde-free particle board.

The building was also designed to be 30 percent more energy efficient than is required by state law. Grass-covered roofs that are thermal buffers, double-paned windows with performance coatings, atria that bring daylight deep into the building, and cool night air flushed through the HVAC system to reduce air conditioning all lessen energy usage. An under-floor plenum supplies air closer to employees than traditional overhead vents and provides space for wiring and cabling, allowing great flexibility in office layouts. Gap anticipates that savings on energy and maintenance will pay for higher first costs within four to six years, faster than the original estimate of eight years. *C.A.P.*

Project: *901 Cherry Office Building, San Bruno, California*
Client: *Gap Inc.*
Building type: *Office building*
Award category: *Private sector, over $25 million*
Key players: *Gap Inc.—Maria Moyer-Angus; William McDonough + Partners (architect)—William McDonough, FAIA, Christopher Hays, AIA, Russell Perry, AIA, Kevin Burke, AIA; Gensler (architect)—M. Arthur Gensler Jr., FAIA, Charlie Kridler, AIA, Kevin Schaeffer, AIA; Swinerton & Walberg (general contractor, building shell and core); Fisher Development (general contractor, interiors)*



GOING RETAIL, **FUTURES BY TEMPS** USES ARCHITECTURE TO TELL ITS STORY.



Taking an employment agency out of an office setting and bringing it into the world of retail required an entirely new design approach for Futures By Temps. "We wanted to reorient our business," says Steven Ettridge, president and CEO of Futures By Temps & Co. "Instead of waiting for the applicants to come to us, we decided to go to them." The company scouted locations in shopping malls and hired an architect with experience in restaurant and hospitality design. The first fruit of the new approach is a 1,500-square-foot prototype "store" where job applicants are the customers, employers are the suppliers, and employment opportunity is the product.

Because the company finds jobs mostly for computer-savvy college graduates, Adamstein & Demetriou Architects designed the store as a three-dimensional Web site, with high-tech materials, overscaled photographic images, and words floating overhead on angled panels. Following the retail model, the architects made the entry a pivotal point in their design, grabbing people's attention with bold graphics and offering forced perspectives through the entire store. "There's no tangible product, so we had to use architecture to emphasize the message—of opportunity," explains architect Olvia Demetriou. The designers also broke down the space into individual zones, using different colors and materials to give each its own identity. The applications area is designed as a café with blue as the dominant color; the testing and training area is reminiscent of market stalls with curved metal canopies and lots of yellow. *C.A.P.*



Project: *Futures By Temps, Reston, Virginia*
Client: *Futures By Temps & Co.*
Building type: *Retail*
Award category: *Private sector, under $1 million*

Key players: *Futures By Temps & Co.—Steven Ettridge, president and CEO, Celia Romaine , project manager; Adamstein & Demetriou Architects—Theodore Adamstein, AIA, Olvia Demetriou, AIA; Malin Construction, Inc. (general contractor)*









A NEW HOME FOR PRAXAIR DISTRIBUTION FITS INSIDE AN OLD WAREHOUSE.

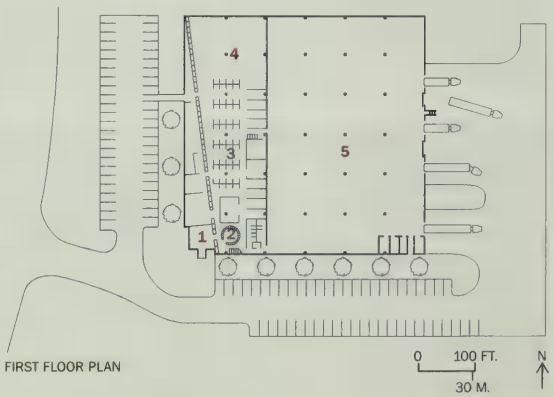
Converting a 58,000-square-foot warehouse into a facility that combines distribution, processing, and office spaces, the project team for the Praxair Distribution Center in Ankeny, Iowa, worked with the building's existing industrial vocabulary to create a workplace with an entirely new character. Instead of fighting the project's very tight construction budget (about $50 per square foot), the architects "used it as a positive force," says Calvin Lewis, FAIA. By exposing the building's structural members and mechanical systems and using industrial materials like perforated metal and corrugated fiberglass, the architects kept costs down while at the same time creating a more daring aesthetic. The most important contributions by the architects, however, came at the beginning of the process, when strategic decisions about future needs were made, says Lewis. For example, by providing space for office growth, the project team saved the company money in the long run.

Since windows couldn't be cut into the warehouse's building shell, the designers brought daylight inside by way of a long skylight slicing through the structure. Underneath the skylight spine is a 28-foot-high metal-stud wall clad with translucent corrugated fiberglass, which spills daylight from one side of the building to the other. *C.A.P.*









FIRST FLOOR PLAN

Project: *Praxair Distribution Center, Ankeny, Iowa*
Client: *Praxair Distribution*
Building type: *Distribution and processing center*
Award category: *Private sector, under $1 million*
Key players: *Praxair Distribution—Rich Matthes; Herbert Lewis Kruse Blunck Architecture—Calvin Lewis, FAIA, Stephen Knowles, FAIA; Charles Saul Engineering (structural); Stroh Corp. (electrical and mechanical); Neumann Brothers Construction (general contractor)*

1. *Reception*
2. *Conference*
3. *Offices*
4. *Expansion*
5. *Distribution*



A FACTORY FOR QMR PLASTICS PUTS WORKERS AND MANAGERS UNDER ONE ROOF.

Conceived as a calling card for the company's entire manufacturing business, this new plastics injection molding plant serves as a showcase of QMR's corporate values—bringing white-collar and blue-collar workers together, establishing an attractive work environment, and manufacturing high-quality products. While QMR wanted its plastics division to have its own identity and home, the facility has also been an effective tool in promoting the company as a whole.

The architecture reinforces the company's values by bringing management, engineering, and production workers under one roof, with only a clear glass wall separating manufacturing from offices. "Visual and physical connections with the people you work with are important here," explains Julie Snow, AIA. The building's 20-foot-high interior space and 90-foot-long clear spans emphasize the sense that "we're all in this together," says Snow. "This isn't a little box for management attached to a big box for workers." The large open space is complemented by a system of under-floor tunnels that provide all power and services and allow great flexibility and efficiency in setting up production operations.

Daylight is another element creating a more productive and desirable place to work. North-facing dormers and a south-facing curtain wall flood the manufacturing floor with daylight. By tipping the steel-trussed roof up toward the view of a wooded ridge to the south, the architects brought even more sunlight into the workspace and established a strong relationship between indoors and out. Much of the 11-acre site has been restored to its native prairie grasses, helping to develop good relations with the community of River Falls. "We set a machine in a garden, with the building as mediator," says Snow. *C.A.P.*

Project: *QMR Plastics Division, River Falls, Wisconsin*
Client: *Quadion Corp.*
Building type: *Manufacturing/office*
Award category: *Private sector, under $25 million*
Key players: *Quadion Corp.—Jim Lande, CEO; James/Snow Architects—Julie Snow, AIA; Coen & Stumpf (landscape architect)*







THE NY TIMES BREAKS OUT OF THE INDUSTRIAL BOX WITH A NEW PRINTING PLANT.

As it was reinventing its daily newspaper—adding new sections and color—the New York Times also rethought the way it manufactured its product. At the beginning of the design process for an entirely new printing facility, the company brought together key players (architects, engineers, consultants, construction manager, and client representatives) and encouraged everyone to question all aspects of the project. "We wanted to show that architecture makes a difference and that great architecture needn't cost a lot of money," states David Thurm, executive director of project development for the New York Times.

The 515,000-square-foot building near La Guardia Airport in Queens sends a strong message to two important audiences: the public and the company's heavily unionized employees. By breaking down the mass of the building into variously colored blocks housing different parts of the manufacturing process, showcasing printing presses behind a giant window of curtain wall, and wrapping the company's logo around two facades, the architects turned an industrial building into an advertisement. And by bringing daylight inside and using raised walkways with views of the presses (instead of dark corridors), the designers created an attractive place to work. Staying under a tight $350 million budget, the architects gave inexpensive industrial materials colorful twists by using them in unconventional ways. As design partner Richard Olcott explains, "They wanted creative solutions that were really cheap, to show you can do a lot with a little." *C.A.P.*

Project: *The New York Times Printing Plant, College Point, New York*
Client: *The New York Times*
Building type: *Printing plant*
Award category: *Private sector, more than $25 million*
Key players: *The New York Times—David Thurm; Polshek and Partners Architects (architect)—Richard Olcott, FAIA; Parsons Main (architect of record)—Nicholas Mariani; di Domenico + Partners (landscape architect); Lehrer McGovern Bovis (general contractor)*







Project: *McNitt Building, Oklahoma City, Oklahoma*
Client: *K. J. McNitt Construction Company*
Building type: *Office building*
Award category: *Private sector, under $1 million*
Key players: *K. J. McNitt Construction (client and contractor); Elliott + Associates Architects—Rand Elliott, FAIA*



DESIGN AS MARKETING: THE MCNITT BUILDING SHOWS ARCHITECTURE CAN SELL.

With the McNitt Construction Company building, what you see is what you'll get, if you hire the company: tilt-up concrete-panel construction. "The building is so direct—it tells the story of the construction process—that it has captured a lot of attention," says architect Rand Elliott. Using concrete panels with different finishes and exposing their joints, bracing, and thinness, Elliott turned the building into a demonstration of the expressive possibilities of a mundane construction method. As a result, the building has become a company signature, a valuable marketing tool, says the architect. The client has already received several new projects, thanks in part to the impact of the building.

The efficiency of the structural concrete panels made possible the addition of a second-level loft, which has provided flexible space that the company can use as storage or as offices for its expanding business. An open area in the middle of the offices has enhanced the company's team approach to work, says the client, and has encouraged greater communication among employees.

Working within a budget of just $50 per square foot, the architect left exposed roof joists and decks and used construction materials as expressive elements in interior spaces. One of the lessons that other clients can learn from this project, says Elliott, is to "see architecture as an investment and not just an expense." *C.A.P.*





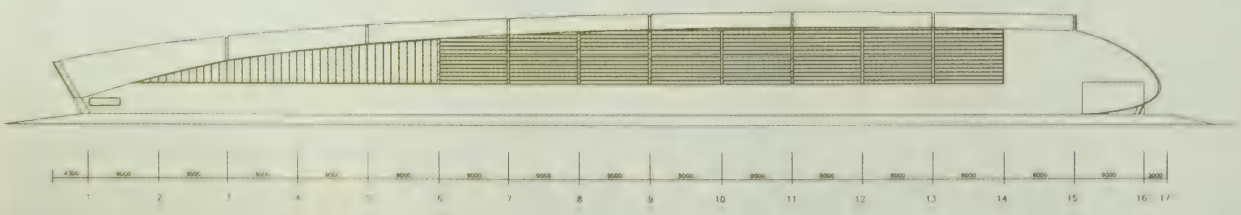
"It's very soft and could be sort of an accident in the flat landscape of Holland. Then you come close and it has detailing and pieces that make it this machine. It manages to bridge the organic and the technological. And that is really special: not many projects do both." *Juror Bernardo Fort-Brescia*

A DUTCH WASTE TRANSFER STATION USES ARCHITECTURE TO BE A GOOD NEIGHBOR.

Waste transfer stations are rarely places that inspire much pride. But the new facility in Zenderen, the Netherlands, makes a powerful statement that architecture can help a needed but unwanted project make peace with its neighbors. The graceful curves of the 469-foot-long structure visually reduce its bulk and give it a friendly appearance. And because the building was designed to be converted into a sports or cultural facility when its adjacent landfill reaches capacity in 15 years, even its function will eventually become more benign.

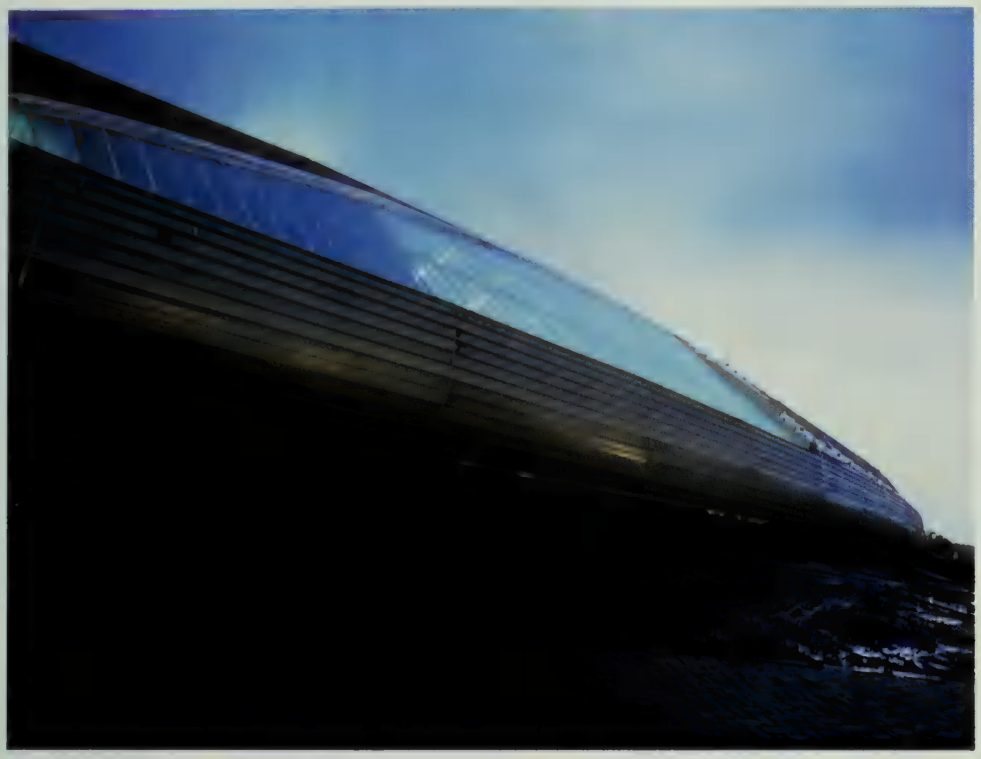
The building serves as a place where garbage is deposited by trucks, sorted into several different categories, and then transferred to a landfill. Water and gasses from the landfill are piped back to the building, where they are treated in a plant in the rear of the facility. "The building rests on the landscape like a large organism," says architect Kas Oosterhuis. Indeed, the building has a "head" where offices and computers are located, a "trunk" for garbage sorting, and a "tail" for water and gas treatment. On its public side, facing the road, the transfer station screens views of its operations and offers few clues to its function. On the opposite side, the building is open so trucks can shuttle back and forth from the sorting hall to the landfill.

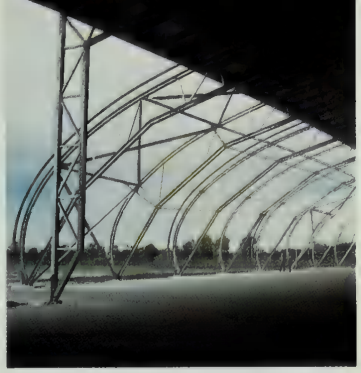
The steel-frame building is clad in aluminum and has a large, irregularly shaped skylight on one side of the roof which brings daylight into the interior. Curving in two directions, the building has sections of varying dimensions. But computerized engineering and fabrication made it no more expensive to build such a design than one with standard dimensions, notes the architect. When the landfill is topped off in the future, the open side of the transfer station can be enclosed and the large column-free sorting space easily converted to another use. *C.A.P.*











Project: *Waste Transfer Station, Zenderen, the Netherlands*
Client: *Regio Twente*
Building type: *Waste-treatment facility*
Award category: *Public sector, under $5 million*
Key players: *Regio Twente—Cep Van Der Steen; Oosterhuis Associates (architect)—Kas Oosterhuis; BDG Raadgevend Ingenieurs (engineer); Heijmans Industries Steel (steel contractor); Nelissen Van Egteren Bouw (general contractor)*



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No one ever said, "Today's another opportunity to be average."

But reaching that next rung on the ladder becomes a little more challenging when the rung isn't there.

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CIRCLE 11 ON INQUIRY CARD



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LISTENING TO: ENGINEERS

IN THEIR STRUGGLE FOR RESPECT, THEY ARE OFTEN PITTED AGAINST OR ALLIED WITH ARCHITECTS.

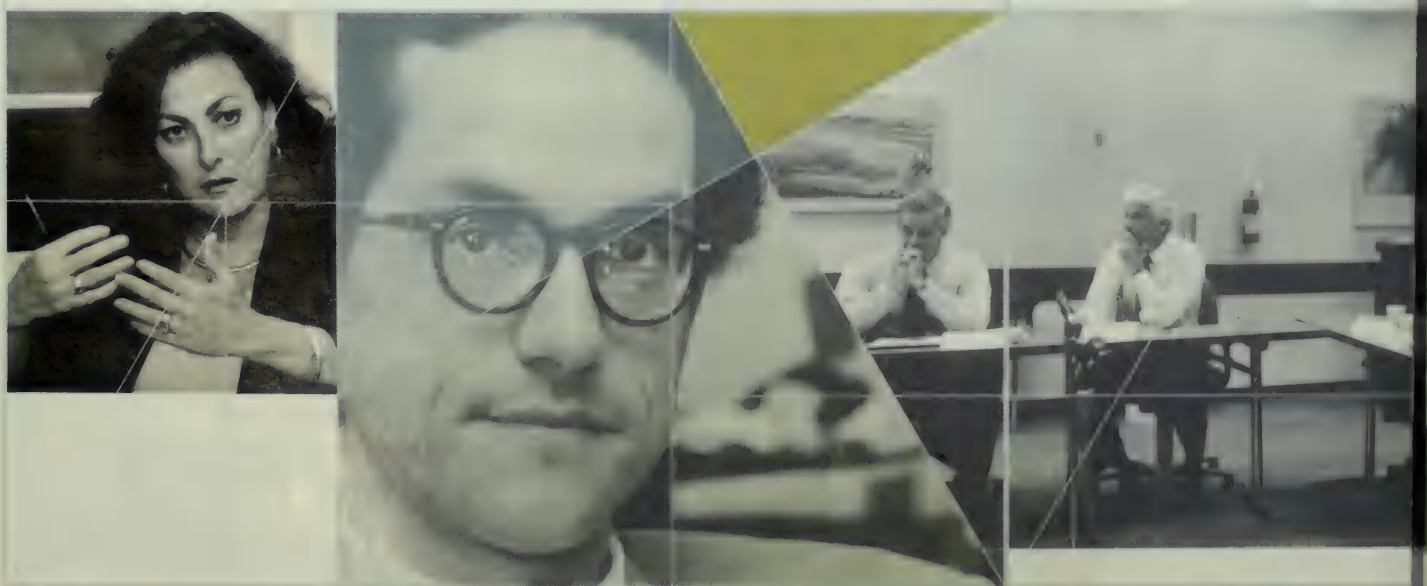
by Barbara A. Nadel, AIA

This summer, RECORD's editor in chief, Robert Ivy, FAIA, convened a panel of 10 prominent engineers to explore how market-driven changes are affecting architecture and engineering. When the three-hour session was over, the participants had shed light, heat, and form on everything from contractual relationships to mutual respect. While the fundamental differences in the way architects and engineers view their work are explicit, it is also clear that the two professions must focus on common goals—if only to protect themselves from those seeking to usurp project management responsibilities.

The engineering firms represented are large, but the discussions covered issues equally relevant to smaller companies. Mechanical/electrical engineers included John Hennessy, PE, chairman and CEO of Syska & Hennessy, a 475-person New York City mechanical/electrical engineering firm with nine offices; George P. Karidis, PE, vice president of SHG Inc. in Detroit, a 340-person architectural/engineering firm with eight American and two Asian offices; Norman D. Kurtz, PE, principal, Flack & Kurtz Consulting Engineers, a 275-person New York City mechanical/electrical firm with two American and three international offices; and Marvin A. Mass, PE, a partner at Cosentini Associates LLP Consulting Engineers in New York City, a 400-person firm with five American offices and 20 European affiliates.

Structural engineers included Kimball J. Beasley, PE, a senior consultant with Wiss, Janney, Elstner Associates Inc. in Princeton, New Jersey, a 13-office, 250-person firm specializing in investigative engineering and remedial design; Jon D. Magnusson, PE, chairman and CEO of Skilling Ward Magnusson Barkshire Consulting Structural and Civil Engineers, a 120-person Seattle firm; Frouma Narov, PE, principal, Urbitran Associates, a 165-person New York City structural, civil, and transportation engineering firm with offices in the United States and Israel; Guy J. P. Nordenson, principal, Guy Nordenson and Associates, a New York City structural engineering firm, and associate professor of the School of Architecture at Princeton University; Leslie E. Robertson, PE, director of design for Leslie E. Robertson Associates and Consulting Structural Engineers, a 50-person New York City firm; and Richard L. Tomasetti, PE, principal, Thornton-Tomasetti Engineers, a 350-person New York City firm with six American offices.

Barbara A. Nadel, AIA, is principal of Barbara Nadel Architect in New York City, specializing in health, criminal justice, and institutional planning and design.



By now, architects and engineers recognize that good personal and business relationships among all construction team members are the foundation of a successful project. But creating that relationship—through contractual arrangements, team leadership, communication, and mutual respect—is not so easy. That's especially true in light of the increasing emphasis on technology, greater competition, and new business relationships that are evolving as a result of current market conditions. How will design professionals work together in the future? What changes do engineers seek from architects? Are design professionals maximizing opportunities for collaboration?

Forty years ago, architects and owners got together and hired the engineers once the design process was under way. But over the past two decades, as various contractual arrangements, including design-build, have developed, the leadership scenario has changed. Engineers now have an even greater stake in the success, profitability, and risk of a project. As a result, engineers also want to be called in at the start of the design process so they can understand and contribute to project goals and budgets.

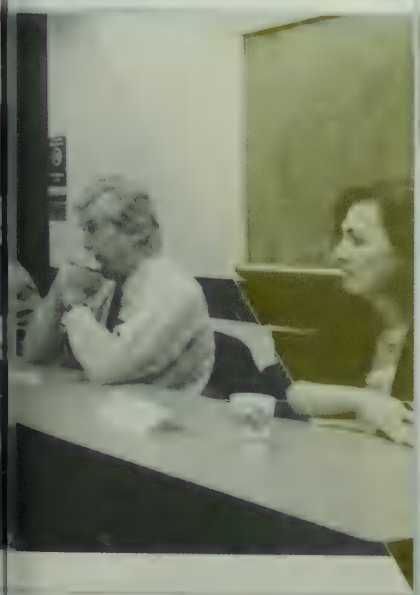
Too often engineers are treated as a commodity, said Norman D. Kurtz. It is up to architects to encourage owners and project managers to base their decision of which engineers to hire for a project on professional abilities and the quality of the relationship, rather than on the lowest fee. "We should be collaborators helping architects, and ultimately owners, achieve their goals professionally and commercially, not subcontractors to be bought and sold for convenience," he said. Strong words, but other panelists agreed that these days price, more than any other ingredient, seems to determine who gets hired.

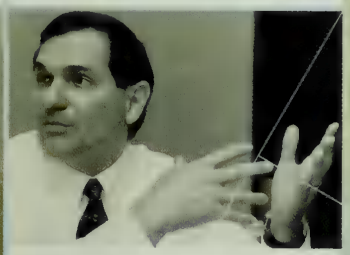
Part of the problem may be that engineers, unlike architects, have no single trade organization looking out for their interests. Engineering professional societies are numerous and fragmented, representing a multitude of disciplines and special interests. This lack of a single, strong voice has not helped those in the building trades to achieve greater respect from the public and other professionals.

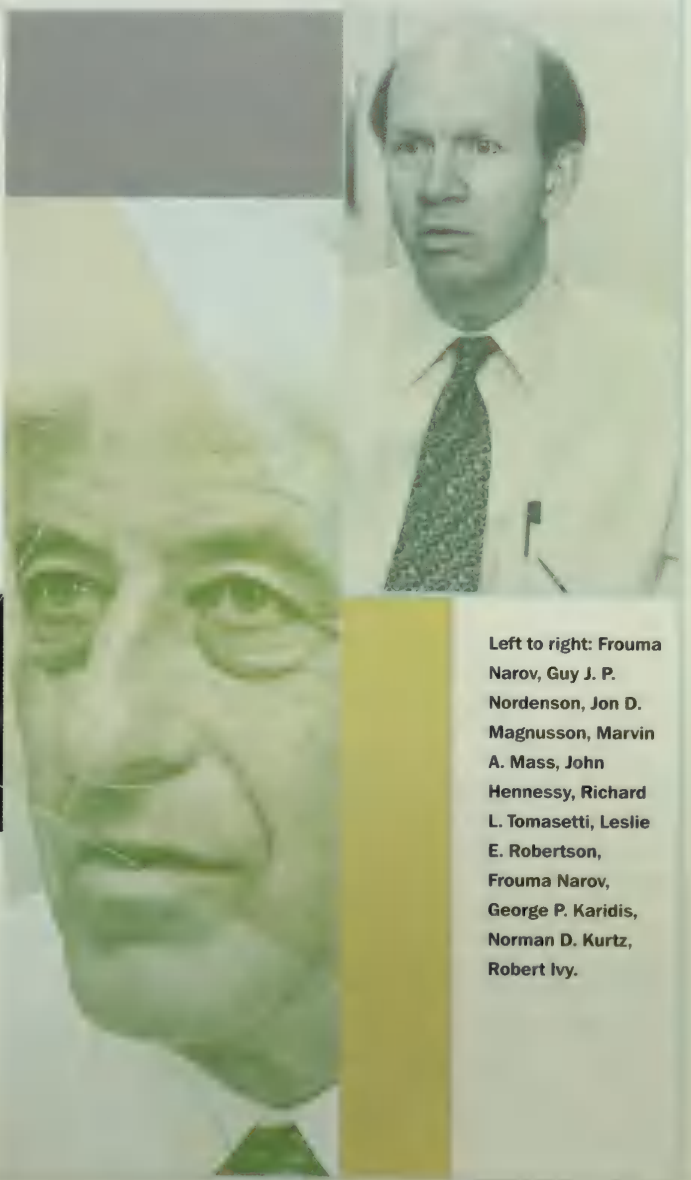
"We should stop talking to ourselves and start communicating with architects, lobbying for the same things [they get], and addressing the public about our skills. That's the key to getting ourselves recognized and making a difference" in the way we are perceived, said Frouma Narov.

Engineers are not perceived as important people in America, though they are highly regarded in other countries, Marvin A. Mass said.

DEVELOPING A GOOD TEAM RELATIONSHIP IS THE BASIS OF A SUCCESSFUL PROJECT.







Left to right: Frouma Narov, Guy J. P. Nordenson, Jon D. Magnusson, Marvin A. Mass, John Hennessy, Richard L. Tomasetti, Leslie E. Robertson, Frouma Narov, George P. Karidis, Norman D. Kurtz, Robert Ivy.

Opposite: Kimball J. Beasley (left); Guy J. P. Nordenson, author Barbara A. Nadel, and Robert Ivy.





"Most of us wouldn't dream of hiring the people the managers bring to meetings, yet it is they who orchestrate the process," Kurtz said. "First they separate the team, interview the architects, beat them up on fees, and then do the same to the engineers. We all march to it. These people charge the owner a substantial fee and justify it by lowering our fees. Projects suffer because the project manager becomes the intermediary between the client and the design professionals, filtering advice, communication, and technical knowledge. These people are unnecessary and don't help the process."

How did this change in leadership happen? According to Narov, architects and engineers are both at fault. "We should have all been more businesslike," she said. "During the 1970s, when construction management emerged, contractors jumped in and architects and engineers relinquished that part of the business. We're doing the same thing now with design-build."

Increasingly, George P. Karidis said, "consultants like Arthur Andersen & Company want to manage all client needs, treating architecture and engineering as sidelines. We bring leadership and synergy to projects," but have not been proactive about promoting these skills.

"The pride and satisfaction of doing a terrific job overshadows everything else for the engineer; that's part of our problem. That's why we take second place and why the Arthur Andersens become the consultants to owners," Narov said. "These people have no technical ability, no knowledge of owner needs, but they know the importance of taking a leadership role. They go out and get an engineer—who works in the back room—while they have the glory and the limelight," Narov said.

Added Tomasetti: "We can blame the attorneys," who may have advised design professionals to go along with the owner's demands so they could keep the work. "But we're the ones who listened to them."

James E. Frankel, an attorney for several of the panelists and chairman of the Construction Industry Practice Group at the law firm of Baer Marks & Upham, was interviewed on this subject after the panel discussion. He agreed that members of the design community are not paid properly for the services they provide, but he pins blame on the shifting demands of the market. "In a competitive market, roles change and fees are whittled down. The design community's abdication of leadership roles corresponds to owner demands for reduced design fees. As a result, the design community reduced its scope of work," Frankel said.

Last May, the *Economist* reported in its piece "Engineering: In Need of Heroes" that the public cannot name any famous engineers, while many architects, such as Frank Lloyd Wright and Richard Meier, are household names.

"We're intimidating, mysterious to architects, and definitely not kindred spirits. We don't have any stature in the architectural community," Mass added. That is particularly true of mechanical engineers, who have less stature than structural engineers, whose work is more comprehensible to architects and the public in general.

However, as Richard L. Tomasetti pointed out, "Respect cannot be demanded, but must be commanded and earned. If engineers are not getting respect, we must ask ourselves why."

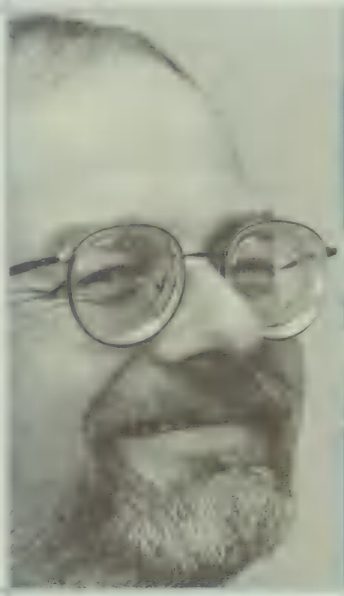
New relationships

Perhaps the biggest change in working relationships within the design and construction field has been the emergence of the project manager as team leader, a role held in the past by architects. The resulting erosion of the architect's role has had repercussions for engineers.



ENGINEERS AND ARCHITECTS ARE FINDING WAYS TO EXPAND THEIR ROLE IN CONSTRUCTION.

A shifting market also means new opportunities. Some engineers and architects are now finding ways to expand their role in the built environment by acting as project managers or owner's representatives, Frankel added. It's not a job for everyone, however. Added responsibilities mean greater compensation, but they also mean greater risk. "Theoretically, serving as project manager means you have greater control over the project. But that's questionable when parts of the team are located across town or in another building. In other words, you can't control every person involved in the project," he said.





Design-build

The second major change in the way business is done has been the advent of design-build, which is the fastest-growing method of project delivery, according to the Building Futures Council. Though engineers and architects are becoming increasingly savvy in these relationships, design-build has greatly altered how leadership roles are structured. "Design-build doesn't mean the designer is out of the picture," Narov contended, "but there should be a way for the designer to assume a place in the process."

The panelists discussed numerous design-build arrangements. One common approach is when a team of architects, engineers, and contractors is assembled, perhaps for a competition, and bids on a project. Another approach is when an owner selects an A/E team, which, in turn, develops a building program, preliminary design, and rough cost estimate. This package may go to the selected design-builder or out for competitive bidding among several design-build teams. Generally the design-builder will also have its own A/E team, whether in-house or as consultants by contractual arrangement. Owners may also want their original A/E team to be available to ensure that the intent of the initial design concept is carried out.

As traditional contracting methods change, engineers want a bigger share of the profits, a more prominent role, and greater responsibility for the overall project. Narov claimed that her most successful design-build projects have been those in which she invested money and became personally involved. She urged architects and engineers to take more risks and demand project equity. Sharing in the profits of an ongoing commercial project could include management and leasing roles, since developers routinely pay leasing agents a percentage of money they bring in.

In the design-build process, the biggest risk comes at the front of the project, when the teams are assembled and pricing is assessed, based on the design. "How often do we get a fee for our design work? We don't get a piece of the action even when we collaborate with the contractor," Narov said. "We want to share in the profits—more than just 25 cents per square foot for the design."

Charging hourly fees instead of getting paid on the basis of value added to a project limits compensation. "Profitable law firms don't succeed by charging $500 an hour but by taking a percentage of the deal, regardless of how many hours they put in," John Hennessy said.

Another alternative is to have design team members receive a share of the profits once the building is sold, Nordenson suggested. If an owner sells a commercial building for twice the construction cost three years after it is completed, for instance, designers should get a proportionate percentage of the profits. This scenario could occur only if everyone involved agreed in advance, Hennessy said. But the prospect of greater profits would go a long way in motivating the individuals involved in the project.

Contractual relationships

Changing leadership roles have an impact on contractual relationships as well. "Engineers must know who holds the contract," Narov said, referring to the often confusing contractual relationships among members of the design and construction team. The engineer may be working for the owner, the architect, the construction manager, a design-build entity, or other individuals or companies. That relationship drives how work is done and who leads the project. And leadership styles must fit the needs of the project. For example, a laboratory may need more coordination than projects where client management takes precedence.

On large, sophisticated projects, consultants often cannot do preliminary work because funding is not available until the design-build contract is signed. That slows work progress. Public projects pose more difficulties, because, panelists agreed, most federal agencies prefer A/E firms over independent consultants. Agencies want a single point of contact and a successful project-delivery track record. "People don't build buildings to keep us employed. They want a less cumbersome process," Hennessy said.

The contractual relationship affects communication channels as

well. Forensic specialist Kimball J. Beasley troubleshoots conflicts resulting from poor communication among owners, engineers, and architects. "Owners don't understand complex technology—cladding and wall systems, waterproofing techniques, routine maintenance needs," he said. "Lack of information and overlapping responsibilities contribute to problems." The result is uninformed clients and a frustrated design team.

By comparison, Jon D. Magnusson cited a project in which the owner contracted directly with him, the architect, and other major consulting entities as full partners. As a result, Magnusson was at the table when key decisions were made about whether to use concrete or steel, for example, or what type of roof would hold up best. As a result, decisions were based on project needs, not just design goals or money concerns.

Engineers have another practical reason for wanting to contract directly with owners: they get paid faster. "Architects think of the engineers as a bank: they'll hold our money for 30 to 90 days. Mechanical engineers are the lowest guys on the food chain," Kurtz said.





Hennessy agreed: "I'd love to have contracts with the owner. That way, I avoid problems if the owner is mad at the architect for whatever reason. I've seen the architect simply add three floors to a project without asking for any additional fee just to smooth over the relationship." Engineers, understandably, don't want to pay for the blunders of other members of a team. "Clients have become pretty savvy," he added. "All they have to do is yell at the architect and they get something free," though often at the expense of others on the project.

Business management

Despite the strong economy, bigger workloads have not necessarily translated to higher fees and greater profits. Salaries are rising fast, as are expenditures, particularly on computer technology. The disparity of low fees in an active marketplace is even more pronounced for public sector clients, especially those relying on fee schedules developed during the 1980s, when work was scarce and clients negotiated fees below published schedules.

Computer technology is also affecting how engineering businesses are managed. Electronic capabilities are creating greater expectations among clients, requiring architects and engineers to produce more detailed drawings than ever before and to be more thorough. Schematics contain much more analysis than they did 20 years ago, panelists agreed.

However, communication is much improved among all team members. "We E-mail drawings to Shanghai, and our answer is there the next morning," Kurtz added. But the price, in terms of investment in workstations, software, and field communication, is substantial. Faster output on tight deadlines may meet client expectations, but hastily prepared documents and specifications often miss critical details, Beasley observed. Employees no longer have time to sit, hold a pencil over a document and think. "Design work requires time, and that's being compressed," he said.

Lawsuits occur as a result of missing or improperly detailed connections, incorrect product specifications, and a lack of familiarity with project specifications—all because work is being done too quickly. Complex, computer-generated documents can confuse contractors, causing more problems. "There's no time to think," Kurtz lamented. "You get the drawings, and 24 hours later they want the answer."

Going global

Almost all of the panelists have maintained some international presence for the past 20 years. Client globalization—through corporate mergers, consolidations, and business expansion—has resulted in more international work, even for mid-sized firms, Karidis noted. For example, one of his firm's domestic clients is Chrysler, which is now German-based

ELECTRONIC TECHNOLOGY HAS IMPROVED COMMUNICATION AMONG PROJECT TEAM MEMBERS.

Daimler-Chrysler. Servicing existing clients with expanding domestic and international needs prompted the Smith Group (parent company of Karidis's SHG) to establish offices in Malaysia and Manila.

"The boom came when the American market contracted between 1991 and 1992," Kurtz said. "The 'rock star' architects and engineers parachuted into Asia for the same reason: we knew how to do high-rise buildings and that's what the Asians wanted [before the economic crisis]. Since then, international work has increased all over."

Some of the panelists fear that American engineers are making themselves obsolete by sharing their expertise with other countries. "We've taught engineers in Europe, Japan, and Jakarta and now they do their projects themselves, without us," Mass said. However, Asians and others have much to learn from American management and communication systems, he added.

A/E firms vs. engineering consultants

What are the benefits of working with multidisciplinary engineers in one shop versus an A/E team in a single office? Karidis, the only engineer representing an A/E firm, said that clients seek synergy in consulting teams. Team organization rewards and shapes behavior. "If you have common interests without competing financial obligations on the same team, you're aligned," he explained. Communication is the main advantage because team members already know each other. "Engineers can study fenestration, overhangs, and building massing while architects can work with engineering issues that might otherwise get dropped if they were just an appliqué to the overall design. Without synergy, design decisions miss important technical issues."

Multidisciplinary firms rarely produce design excellence within all divisions, prompting savvy owners to "cherry-pick" the strongest departments from among several engineering firms for a project. Excellence is not consistently found in one firm because people who excel at their trade often leave to start their own shops and be their own boss, Hennessy said. "Architects and engineers are fiercely independent. Finding design excellence—in architectural and all engineering disciplines—in one firm is unimaginable."

Yet A/E firms are not precluded from hiring top talent and offering excellence in different areas. "A/Es are well suited for large, complex projects requiring good coordination, such as research labs, where integration is the heart of the problem," Karidis emphasized. Decisions to hire an A/E firm, rather than several consultants, often depend on the project, the region, and the client.

What's ahead

Engineers and architects face important technology issues in the next decade. Indoor air quality, which is affected by everything from exterior wall systems to finish materials, is a growing concern. Seismic and wind design technology will continue to be an issue, as will energy conservation and sustainability. More research in areas of mechanical engineering is needed, Mass said. "Cooling towers are the same as they were 50 years ago," he explained. Panelists agreed that there is too little research and innovation.

On the business front, compatible software platforms facilitating greater communication and coordinated drawings would benefit architects and engineers. Design-build will continue to grow and be refined, though many of these relationships are likely to be defined in court rather than in the field.

But most important, architects and engineers must remain united against external pressures applied to the design field. "We must look to each other for broad design and business solutions, rather than limiting our relationship to how buildings work," Robertson said. Narov agreed and urged architects and engineers to become politically active. "We can accomplish more by working together, identifying causes and candidates that will give us a better profession and a better quality of life." ■





Jon Magnusson (above) said engineers are motivated to do better work when architects show an interest in technology and provide drawings with technical details.

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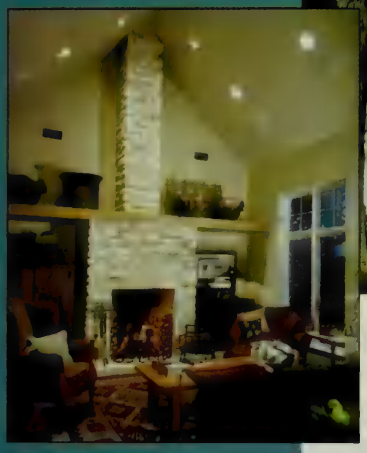
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CIRCLE 57 ON INQUIRY CARD



The Debis Tower's profile was made as an act of pulling apart. It is an assemblage in which each element—stair tower (opposite), elevator core, office space—is separately articulated.

CRITICISM A striking presence on the Berlin skyline, the DEBIS TOWER, by the Renzo Piano Building Workshop, revives the skyscraper.



by James S. Russell, AIA

The extended hangover of commercial overbuilding in the United States and the implosion of Asia's building boom might suggest that there's not much reason to build tall office buildings anymore. But a trip to Berlin can be bracing. Take the U-Bahn to the Gleisdreieck stop, then stroll west along the Reichpietschufer, which follows one of the city's canals. As you round a curve, a crystalline sliver, some 20 stories high, appears with a delicate zigzag ascending it. This proves to be an exit-stair enclosure at the southernmost extremity of Renzo Piano's Debis Tower, a landmark within the Potsdamer Platz redevelopment, one of the largest commercial-building projects recently undertaken in the world.

Translating the mundane need for egress into an object of such athletic elegance is just one way in which the new Debis Tower transforms the office-building type. Debis looks not like one tower but several. The architect has carved the typical office-building box into a grouping of bundled slabs, alternating sheer glass elevations with ones clad in ocher terra-cotta panels and rods.

Piano's accomplishment here lies not only in the creation of an urbanistically sophisticated, environmentally progressive, and technologically advanced workplace. He and his firm, the Renzo Piano Building Workshop, which is based in Genoa, Italy, and has a satellite in Paris, may have single-handedly recaptured the long-lost romance of the skyscraper.

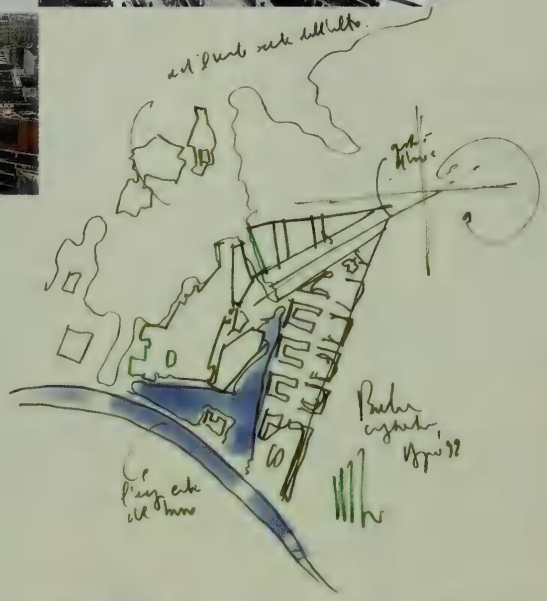
Such an outcome could not have occurred without an extraordinarily committed client and a well-considered site master plan, also designed by the Piano office. But it is also the progeny of monumental political change. Flash back to November 1989, when the Berlin Wall came crashing down. Not long after, East and West Germany were united. In the ensuing jubilation, Berlin was seen as the gateway to the entire former Eastern bloc, a half-continent expected to grow rapidly as capital flowed in to bring East into economic parity with West. A 728,000-square-foot, mostly empty chunk of former barbed-wire-entangled no-man's-land went on the block. The wedge-shaped acreage was tanta-

Project: *Debis Tower, Berlin, Germany*
Architect: *Renzo Piano Building Workshop—Renzo Piano, B. Plattner, C. Kohlbecker, R. Baumgarten, P. Charles, A. Chaaya, G. Ducci, J. Ruoff, J. Moolhuijzen, F. Pagliani, J. B. Mothes, S. Baggs, M. van der Staay, N. Mecattaf, L. Penission, C. Hight, M. Kramer, D. Putz, G. Oug, A. Giordano, S. Ishida, G. G. Bianchi, O. De Nooyer, E. Piano, E. Baglietto, J. Fujita, D. Guerrisi, R. Sala, S. Schaefer, K. Shannon, R. V. Truffelli, F. Wenz, H. Yamaguchi, J. Barnbrook, H. Falk, A. Hocher, R. Jatzke (design team)*
Engineer: *Boll & Partners, IBF (structural); Ove Arup & Partners (structural, mechanical, electrical)*
Consultants: *Drees & Sommer (environmental site management)*









City within a city Most of the Daimler-Benz Potsdamer Platz development is just now opening. It will test whether Berlin's commitment to a limited reinvention of its prewar tradition of flush-to-the-street buildings surrounding rich networks of leafy internal courtyards (original Potsdamer Platz, top right) can be translated to 21st-century conditions. Piano's master plan (early sketch right, plan above) hopes to draw the crowds the old Potsdamer Platz did by deploying numerous attractions throughout the complex, including an IMAX theater, a covered shopping street, and a piazza (named for Marlene Dietrich) embraced by a musical theater complex and a casino. As it emerges from scaffolding and dust, there is no doubt that this is a contemporary place. From the south, the Debis Tower is like a prow for the entire ensemble, slicing through a network of reflecting pools that Piano extended from the adjacent canal. *J.S.R.*

lizingly located, hugging what once had been Potsdamer Platz, one of Berlin's liveliest intersections before World War II. Daimler-Benz, parent of the famous Stuttgart-based carmaker Mercedes-Benz, purchased the land. The chance to rebuild one of the key sites in the city was close to the heart of Edzard Reuter, head of the company, who was the son of the city's first mayor after the war.

Before the site could be developed, Berlin's Building Senate held an urban design competition for it, which was won by the Berlin architects Hilmer and Sattler. They redrew the axial boulevards that had once met at Potsdamer Platz, divided the site into parcels, and determined a street-wall height of 35 meters (about 115 feet) pursuant to the "critical reconstruction" tenets that have guided the reuniting of Berlin. The idea was that the new Berlin would have an urbanistic continuity with what remained of the prewar, pre-Wall city.

Daimler-Benz then held a competition for an architect to take the scheme to a more detailed level, which Piano's office won with Christoph Kohlbecker. At the unveiling of the scheme, Piano said that it "draws out the past for its foundations, while keeping its modernity through discipline in the use of materials and of all the technology at our disposal." An international roster of architects was hired to design buildings for all 19 parcels, including Jose Rafael Moneo, Richard Rogers, Arata Isozaki, Lauber + Wöhr, and Hans Kollhoff. Some of the key parcels were assigned to Piano, including the largest and southernmost, on which grew the tower for Debis, a Daimler-Benz subsidiary created in 1990 to handle real estate development and management, financial services, insurance, information technology, telecommunications, and media services.

Out of this plan came a project that was as much a symbol as a building. It was an emblem of Daimler-Benz's commitment to a united

REBUILDING ONE OF THE KEY SITES IN THE CITY WAS A PERSONAL GOAL OF DAIMLER-BENZ'S LEADER.

Germany and a rebuilt Berlin. Under such circumstances, no bland, American-style developer's hulk would do. But Piano's own master plan did not make designing the building too easy. The parcel is a long rectangle, with its northwestern corner stretched into a wedge. Its planned density would have been high for Berlin, but floor-area limitations meant that the envisioned tower—a kind of exclamation point for the whole development—could not be bulky.

Reconciling the massing of the 482,000-square- *(text continues)*

The west elevation is clad in an outer layer of operable, sensor-driven glass panels. They reflect light differently according to the angle at which they are pivoted. External blinds, also operable, change the visual texture of the wall. Depending on the sun's angle, parts of the facade may be open and parts closed simultaneously.



A crystalline scrim At the east, south, and west elevations of the tower, which have the highest solar heat-gain exposures, the architect placed a sheer layer of glass panels 27 inches outside an inner wall of operable glass windows. Fabricated by Götz, the outer glass panels pivot open up to 70 degrees for warm-weather ventilation. Controlled by sensors, the panels open enough to allow ventilation while buffering the high winds that can occur. Closed, they create a winter insulating layer.

Occupants are protected from glare by external blinds, which they can lower from inside. They can also tilt or swivel open both the upper and lower panes of insulated glass lights on the inner wall for ventilation. The upper light opens automatically at night when the weather is warm to vent heat accumulated during the day.

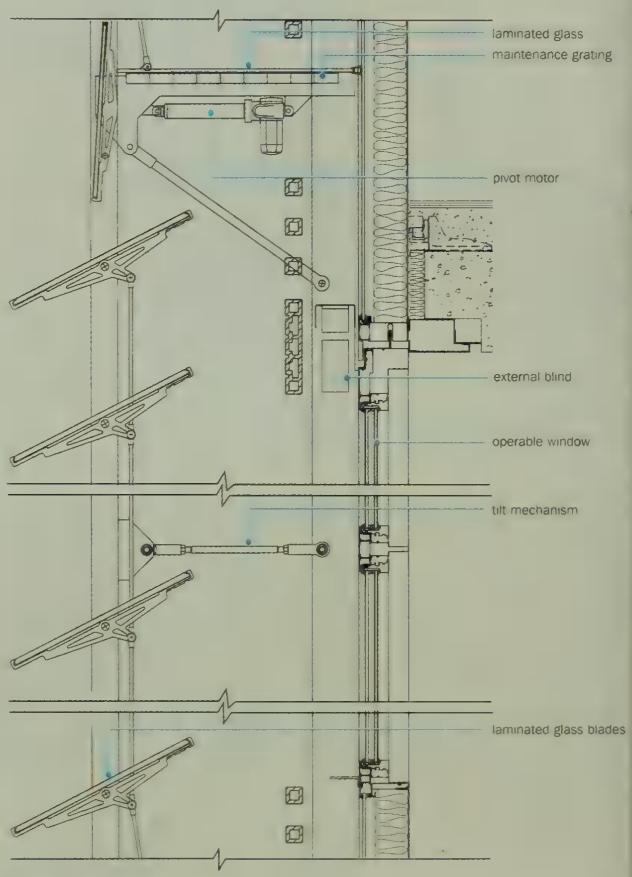
Maintenance platforms, set between the glass layers, act as horizontal sunshades and are topped by laminated safety glass to stop the spread of fire and smoke.

Compared to a conventional sealed building, this is a very elaborate and maintenance-intensive curtain wall. But it offers considerable advantages in terms of energy conservation, daylighting, user comfort, and user control. It is arguably more complex than earlier structures that pioneered these curtain walls, such as RWE, in Essen, Germany [RECORD, January 1997, page 144], and Commerzbank, in Frankfurt [RECORD, June 1998, page 68].

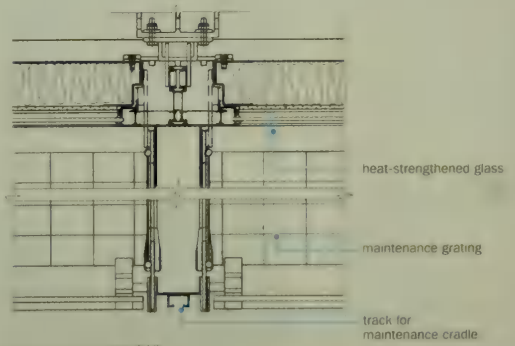
Could it be done in America? The energy-conservation and glare-control aspects of such a system would be even more advantageous in most of America, which is warmer and sunnier than northern Europe. But high humidity in much of the United States limits the value of natural ventilation. As for cost, tall buildings are generally far less expensive to build in America, but heavily customized curtain walls are more common in Europe, so the premium for such specialized technology in the United States would likely be far higher. *J.S.R.*

Götz, the curtain-wall fabricator, built the inner window wall, the outer skin's supporting structure (below), and the motorized pivoting devices for the operable glazing (details).





SECTION THROUGH CURTAIN WALL



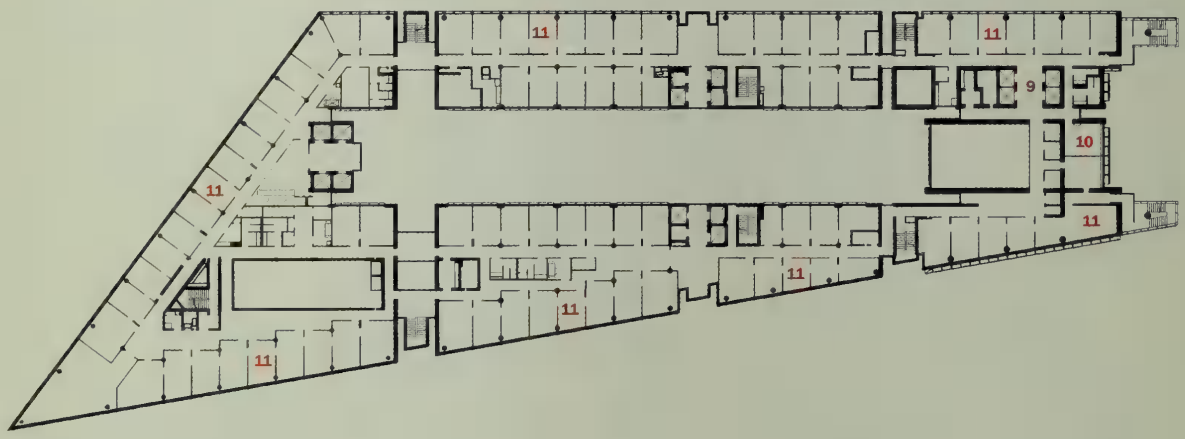
PLAN DETAIL AT SPANDREL

At the southern end of the building, Piano peels away the successive layers of the curtain wall, revealing outer pivoting glazing, the outer-wall support structure, terra-cotta rods, and inner glazing. It is the singular accomplishment of the tower to aestheticize such a complex functional system.

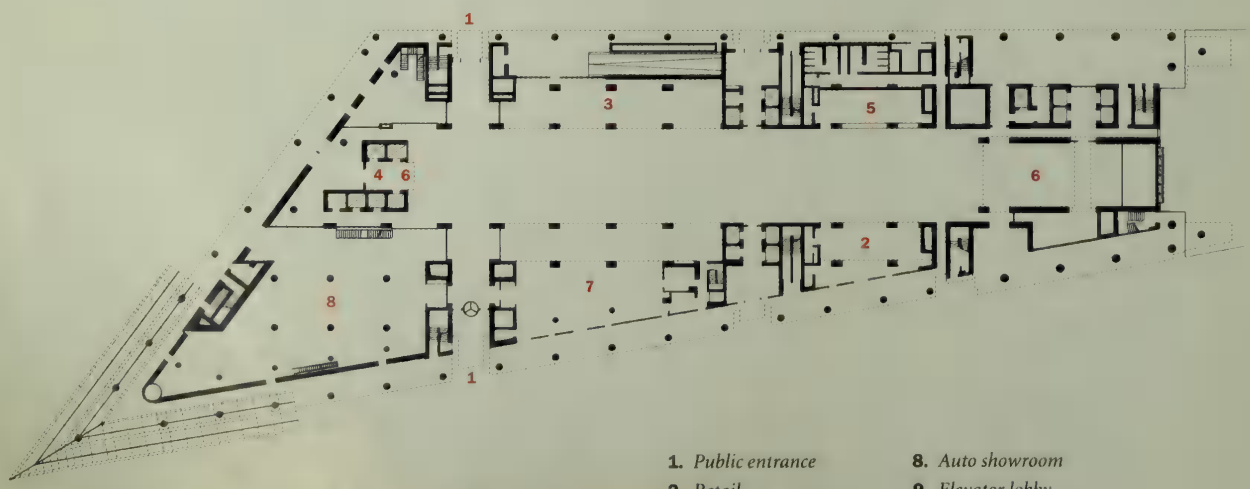




13TH FLOOR



THIRD FLOOR



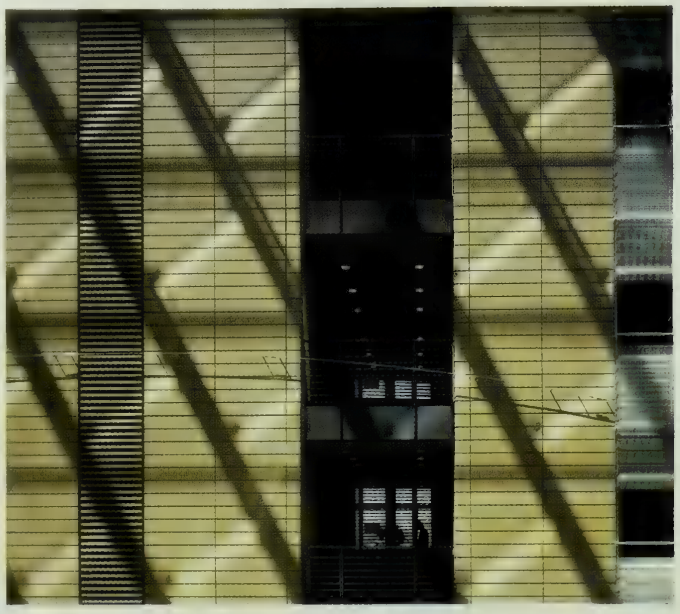
GROUND FLOOR

0 50 FT.
15 M.

1. *Public entrance*
2. *Retail*
3. *Coffee shop*
4. *Staff entrance*
5. *Exhibition*
6. *Visitor entrance*
7. *Cafeteria*
8. *Auto showroom*
9. *Elevator lobby*
10. *Meeting room*
11. *Office*
12. *Skylight roof*
13. *Sodded roof*



Plans (opposite) show how nearly every building element has been carved away to reveal itself on the exterior. Following German building regulations, the majority of work spaces include an operable window.



Sunlight from the atrium's all-glass roof is diffused through milky glass panels fixed at an angle (left). Additional fins are mounted at the office windows that face the atrium. The solid cladding is terra cotta.

foot building to the urban scale of Berlin was the chief problem posed by the site, explains Bernard Plattner, who was the architect-in-charge for the tower. The urban-design criteria mandated a street wall along the 600-foot western edge of the site. To break down the scale of this unappealingly long block, Piano carved recesses into the facade, dividing the elevation into four elements that almost appear to be separate buildings. (The tallest shaft is actually a ventilator for the vast underground area of the Potsdamer Platz development.) The architect scooped a monumental atrium out of the deep center of the block to satisfy German building regulations that limit the depth of the floor plate by mandating how far most workers can be from a window (about 25 feet).

Piano saw each element of the tower—elevator core, stair towers, the ranges of offices facing east, south, and west—as a potentially expressive element. He pulled them apart, with the recesses acting as visual membranes. The overall impression is of lapped slabs of solids and glassy membranes—a kind of contemporary San Gimignano of towerlike elements.

The design of Debis is not all bravura. Building on experience gained on a number of past projects, Piano's office used glass and terra cotta to make what is among the world's most sophisticated curtain walls. Like an increasing number of technically advanced German buildings, Debis has a double-wall curtain wall.

The combination of shading, the double wall, and operable windows reduces external warm-weather heat loads, winter cooling loads, and internal heat loads. The concrete floor slab is exposed at the outer edges of the floors, which enhances energy conservation by absorbing excess heat from below in the daytime and radiating it at night.

For the building as a whole, this means that air conditioning is

AIR CONDITIONING IS SUPPLEMENTARY, NOT MANDATORY; OCCUPANTS CONTROL THEIR OWN ENVIRONMENTS.

supplementary, not mandatory. Yet office occupants can control their own environments more than those who work in sealed, constantly air-conditioned buildings. At Debis, most people sit next to windows that can be opened. External blinds can be lowered to reduce glare.

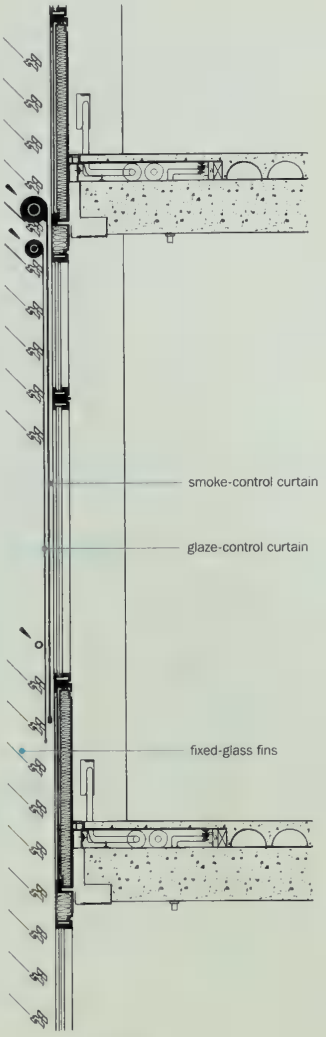
In other respects, the interiors are conventional. Most of the staff is housed in one- or two-person white-painted private offices. The building recesses along the exterior signify sub-lobbies inside, which help people orient themselves in what otherwise could be a confusing racetrack of hallways.

The atrium is monumental in the time-honored corporate style, even though it invites public use through the provision of changing art exhibitions, an auto showroom, a coffee shop, and a cafeteria open to the public. Piano softens the effect by mounting angled, milk-tinted





Though the atrium is vast (looking south this page, north opposite page), the diaphanous quality of the skylight system and the solar-protection fins (right) visually dissolves the space's borders.



WALL SECTION

glass panels below skylights to gently diffuse sunlight into the six-story-high atrium space.

Piano often speaks of what he does as marrying construction technique with an overarching design idea. At Debis, the close-up experience of the building is unusually tactile, rooted in the materials and the way they are put together. At some times of the day, the sun sparkles from the beveled bottom edge of the pivoting glass panels; at others, it picks out elements between the glass walls: the vertical glass returns, the metal facade-support structure, or the maintenance platforms. The terra-cotta elements don't move, but their raw-clay finish invites touch. The rhythm of open and closed cladding along with deepening and lightening shadows as the light changes through the day have their own sensuous appeal.

Debis, as manager of the 19-building site, saw its own tower as a prototype for future corporate real estate endeavors. The company used the building to test innovations in energy-conserving building design and in environmentally sustainable techniques. In cooperation with BEWAG, the local electric utility, a new power plant is being built for the entire Potsdamer Platz site. Its waste heat will be distributed by pipe to heat or cool the buildings by the absorption method. A graywater system routes rainwater to sodded roofs over the Debis building's low-rise section. The excess fills the pond that surrounds the building. Building ecology experts Drees & Sommer advised on the use of lower-toxin products and construction materials.

The gigantic scope of the overall development also imposed limitations. To avoid overburdening local streets, most material was delivered to and waste removed via an adjacent staging area constructed for the purpose, served by freight rail and barges.

At the building's topping-out ceremony in 1996, the company celebrated by bringing in an orchestra and the conductor Daniel Barenboim. As the musicians played, 20 tower-crane operators around the 17-acre Daimler-Benz site moved their massive charges in time to the music. Since cranes have become the hallmark of Berlin's skyline over the years since the Wall crumbled, such a ballet of 150-foot-high mechanical storks was strangely fitting. The Daimler-Benz complex, if the Debis Tower is any indication, may offer this rebuilding city much to celebrate. ■

Sources

Curtain wall: *Götz*
Curtain-wall operating system and sensors: *Colt*
Terra-cotta cladding: *NBK*
Extra clear glass (ceramic-fritted in atrium): *Sanco, Varema*
Exterior blinds: *Varema*
Granite floor: *Hoffman*
Lighting: *Sill (roof lighting, atrium); AEG (uplights in offices); Erco*
Concrete: *Alpina*



The west entry facade of the new building at St-Benoit is almost a caricature of a traditional church.

A church added to Quebec's **ST.-BENOIT-DU-LAC ABBEY** is a modern take on traditional, austere Benedictine design.

by Beth Kapusta



Long before urbane Montrealers colonized Quebec's Eastern Townships as a recreational playground, a small group of French Benedictine monks recognized the exceptional beauty of the landscape. In 1912 they established the St.-Benoît-du-Lac Abbey in a remote spot among the worn mountains, with a view overlooking the jewel-like Lake Memphramagog. Following a series of projects—some completed, some unrealized—over the ensuing decades, a new church designed by Montreal-based architect Dan S. Hanganu has added a contemporary layer to the meditative retreat.

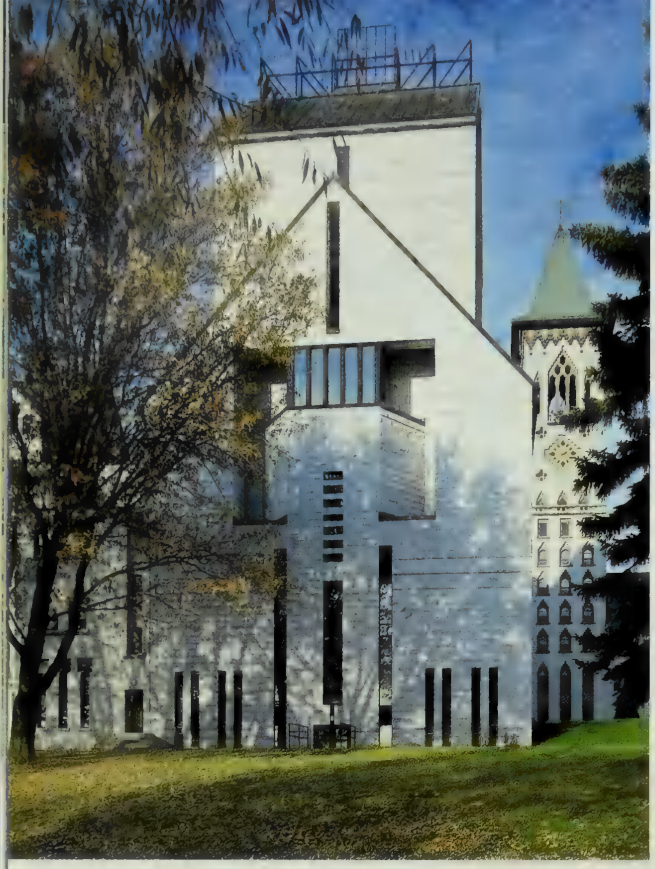
The Benedictine tradition goes back to the sixth century and has long been one of the most hermetic and contemplative of the monastic orders. In the 12th century, the austerity of the Benedictine order became a defining aspect of monastic buildings, leading to two distinct traditions—one, a very sparse variation on the Romanesque, and the second, a Gothic that emphasized the dematerialization of substance—in protest against what the monks deemed excessively decorative and materialistic architecture.

Beth Kapusta, who graduated from the University of Waterloo School of Architecture in 1991, teaches at the University of Toronto School of Architecture and is working on a book about the National Archives of Canada. She lives in Toronto.

Monastic architecture still has a tenuous continuity in Quebec, where Roman Catholicism is the predominant religion among the French-speaking population. The St.-Benoît abbey has an interesting history, as documented by the monk/architects who left their mark in succession.

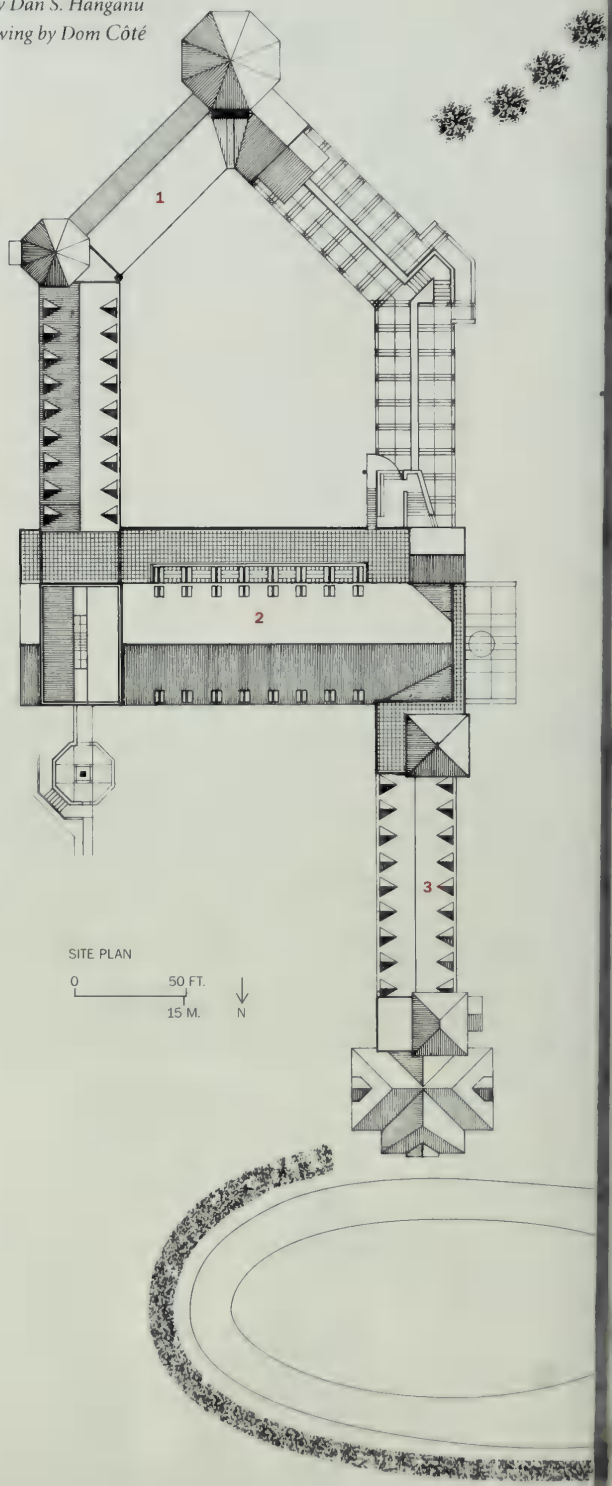
The first permanent buildings at St.-Benoît were designed by Dom Bellot, a talented French monk/architect who also designed St. Joseph's Oratory in Montreal and several notable religious buildings in France. The plans he generated for the abbey in 1938 (the monks had been in temporary lodgings since its inception) were only partially completed, but what did get built creates an exuberant polychromatic

Project: *Church at St.-Benoît-du-Lac Abbey, St.-Benoît, Quebec*
Architect: *Dan S. Hanganu Architectes—Dan Hanganu, partner in charge; Thomas Schweitzer, Guillaume de Lorimier, associate architects; Gilles Prudhomme, Esther Varkay, Alex Touikan, Viorel Indries, Ilena Neich, Gabriel Sydenham, Todd Richards, François Poirier, Guy Pageau, Anthony Fieldman, Charles Garant, project team*
Engineers: *Shector Barbacki Shemie + Associates (structural); CIMA-LNR (mechanical and electrical)*
Consultants: *Ari Alavanthian (lighting); MESAR Consultants (acoustics)*
General Contractor: *Phase I*





1. *Cloister by Dom Bellot*
2. *Church by Dan S. Hanganu*
3. *Hostelry wing by Dom Côté*



A view from the rear of the church toward the west (top); the main entrance, with its abstractly rendered rose window (bottom).

Beyond the new church to the north stands the tower of the hostelry wing, designed by Dom Côté.



symphony. Bellot's disciple, Dom Côté, continued work on the abbey in the 1950s with an even more outrageous palette inspired by a rather unsettling combination of styles: a little French château, some vaguely Moroccan influences, and a healthy portion of 1950s Modern thrown in for good measure.

Dom Côté never finished his part of the project either. Construction periodically ground to a halt as funds ran out, and in the late 1950s a partially completed foundation for a new church, which would have closed the courtyard of the U-shaped Bellot cloister and joined it to a new wing by Côté, was abandoned.

DECORATION IN THE FORM OF FIGURATIVE ART IS ABSENT, WITH THE EXCEPTION OF STAINED GLASS.

That's where Hanganu came in. His firm, Dan S. Hanganu Architectes, was selected through a limited competition in 1989 to complete the unfinished church. He proposed staying close to the unbuilt design from Côté's 1950s plan, working with its rhythms and proportions but applying his own palette and sensibility.

Hanganu ended up with both Romanesque weight and Gothic dematerialization in his design, inside and out, although the scales appear to tip in favor of the former. The west entry facade of the church is almost a caricature of a traditional church. The outline of the main section is matched by the shape of the front elevation, with the stone dematerializing into vertical piers. Behind, a tenuous galvanized-steel monastic promenade leads between the old tower and Hanganu's new one.

The cool exterior elevations provide the Romanesque weight, an effect solidified by the gray local granite. The rather heavy steel diagonals that run through the abstractly rendered rose window give little indication of the more delicate sensibilities within.

The new church was built directly on the base of the earlier, unfinished structure. While the organizational principles are largely rooted in a simple Romanesque basilica hall plan, with a short tower over the altar, an exercise in dematerialization unfolds inside. For Hanganu, a reductive treatment of surface became an alternative to decoration. "Every time there was a need for decoration, I removed material rather than adding it," he says. For example, Hanganu used depletion to establish motifs in the brickwork along the piers in the chapel. The corners undergo an orderly, codified erosion that distinguishes those in the triforium from the corners in the nave.

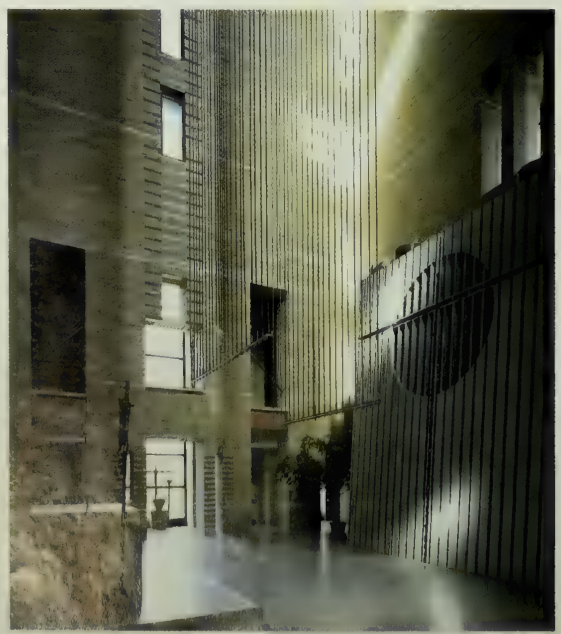
A preoccupation with transparency is rendered not in expanses of glazing but in narrow slices of cut-away material, which allow secretive connections between adjacent places. Between the atrium (the foyer at the "public" end of the hall) and the church, for instance, the heavy wood doors are parted by a slight gap, so the interior is always visually accessible even when the church is locked. Hanganu explains: "Faith is about seeing beyond."

Hanganu's austere strategy provides a successful contrast to the visual overload of Dom Côté's addition. Decoration in the form of figurative art or applied ornament is absent, with the exception of stained glass—a gift from the French government—which has been virtually entombed in a glass box surrounded by the tower stair.

Leaving exposed the shaped concrete piers begun by Côté, Hanganu added two subsequent layers of structure in the chapel: buff brick piers that build on the existing concrete, and—as if to separate the burden of the roof (or perhaps the heavens) from the simple compression of the earthly walls—an internal buttressing network fashioned from steel, supporting a simple peaked roof. The pageantry of the liturgical ritual is celebrated in an almost theatrical gesture: a large opening in the brick screen between nave and sanctuary has the unmistakable quality of a proscenium.

Even in the increasingly secular world of the late 20th century, religious architecture can still elicit a strong emotional response. Sacred spaces have a sensory dimension that transcends the merely visual, with the smell of incense, the echoes of footsteps and voices, the coldness of the lofty spaces, the rituals of touch. At St.-Benoît, these various sensory experiences play an important role in setting the tone of the space. The

Light streams in from the tower over the altar (right). The interior is meant to be easily visible from the atrium (far right).







EXPRESSING THE BENEDICTINE IDEAL THROUGH A UNIQUE ARCHITECTURE

Père Jacques Bolduc, a Benedictine monk who was in charge of raising the funds to make the most recent addition possible, describes living in St.-Benoît's monastic order as simply "a life of prayer and work."

The rhythms of life revolve around these activities, beginning very early in the morning with prayer and continuing throughout the day with work on the surrounding farm, where the 55 resident monks make cheese and apple cider. They also run two guest houses.

The Benedictine order first found its way to the Eastern Townships in 1912 (the countryside bears a strong similarity to the area in France from which the monks came). "At that time, the [French] government was extremely anticlerical, so the Benedictines decided to come to Canada," says Père Bolduc.

Construction proceeded very slowly: work began on Dom Bellot's first building in 1941, and the second increment by Dom Côté was built between 1955 and 1962.

"Dom Bellot thought the Arabs our masters. He looked for inspiration in such buildings as the Alhambra," Père Bolduc says. "His sense of the mathematical was very acute." Dom Côté too was impressed with Arabic architecture; the floor of his entry hall was inspired by the mosque at Ispahan.

When it comes to Dom Côté's subsequent work, Père Bolduc, like many of the monks, is less enthusiastic, as the unbridled decorative excess of much of the design seems to go against the grain of the Benedictine dictum of austerity. "Dom Côté was very audacious—maybe too much so," he says.

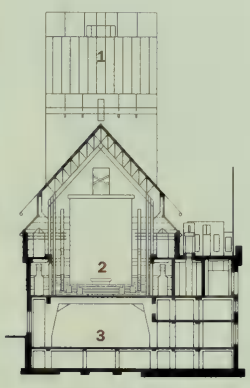
Though he is not a Catholic, Dan Hanganu added to the monastery in a way that has deeply impressed the monks who live there and considerably increased the patronage of the church. Interestingly enough, Hanganu was selected by the highly communal order on the basis of the strength and individuality of his personal style.

"Hanganu is a man of great culture and artistic talent, who speaks many languages and knows well the history of architecture," says Père Bolduc, noting that the resident monks worked closely with the architect through a laborious five-year design and construction period.

"During construction, everybody had an idea. But ultimately Hanganu made the soup—and he was appreciated for that. His understanding of the complicated procession, ceremony, and liturgy of the Catholic Church is well represented in the architecture." *B.K.*

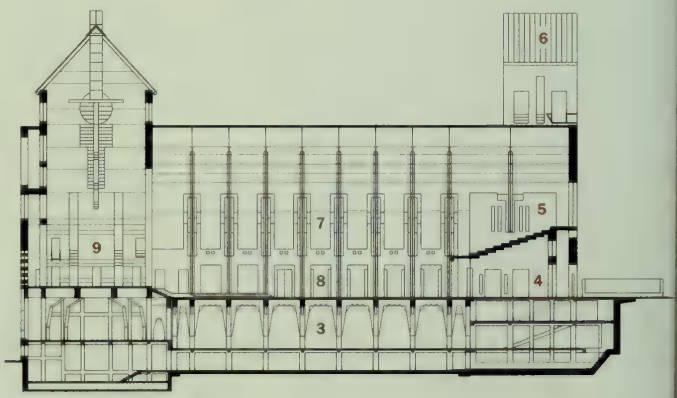


What a strolling monk might see, down the row of arches that runs above the nave.

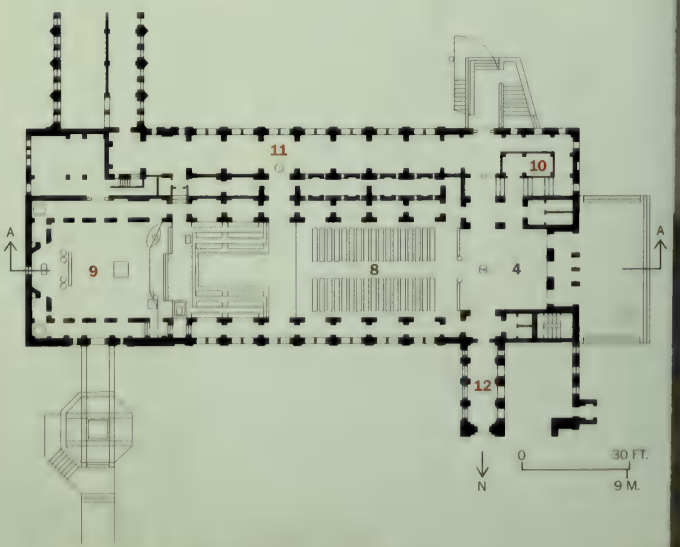


SECTION THROUGH SANCTUARY

1. *Sanctuary tower*
2. *Altar*
3. *Existing substructure*
4. *Atrium*
5. *Tribune*
6. *South tower*
7. *Triforium*
8. *Nave*
9. *Sanctuary*
10. *Chapel*
11. *Cloister*
12. *Hostelry wing*



SECTION A-A



FLOOR PLAN



The church features an internal buttressing network fashioned from steel, supporting a simple peaked roof.

precise appearance of the wood handles belies the tactility of a carved imprint of hands where a visitor opens the door. Light is made palpable as the rising smoke of incense curls around the cables suspended in the sanctuary tower. The crispness of the interior details—such as the flush brick joints that create smooth, hard surfaces—contributes to a rich acoustic environment. The materials themselves are imbued with symbolic significance. The gold mosaic tiles at every threshold are charged with the task of separating sacred space from the outside world.



The contemporary addition to the old monastic promenade begins with a ring of open galvanized-steel risers winding up the new east tower, leading to a spectacular view of the surroundings and continuing across a galvanized-steel bridge leading to the Dom Côté tower and a series of outdoor terraces.

The St.-Benoît-du-Lac Abbey exhibits an acute intuition about how to carry the spirit of the past into the present. Hanganu's strongest work shares this quality; most notably, his archaeological museum at Pointe-à-Callière in Montreal, a modern design atop an archaeological site, attests to his dexterity in historical superimposition. It is humbling to think that the profound questions of architectural metaphysics posed by this modern sacred space have changed very little in the course of several hundred years—and heartening that they still prove so challenging and so evocative. ■

Sources

Steel structural system, steel and glass entrance doors: *Aciers Yameska*
Granite masonry: *Beebe Quarry*
Curtain wall, aluminum window frames, sliding doors: *Kawneer*
Elastomeric roofing: *Soprema*
Roofer: *Couverture Montreal-Nord*
Metal and oak doors: *Bumeda*
Glass glazing and skylights: *Thermalite*
Clay brick interior of nave: *Brigereterie St. Laurent*
Interior and task lighting, downlights: *Novus Lighting*
Exterior lighting: *Louis Poulsen*
Granite floor: *RAMCA*

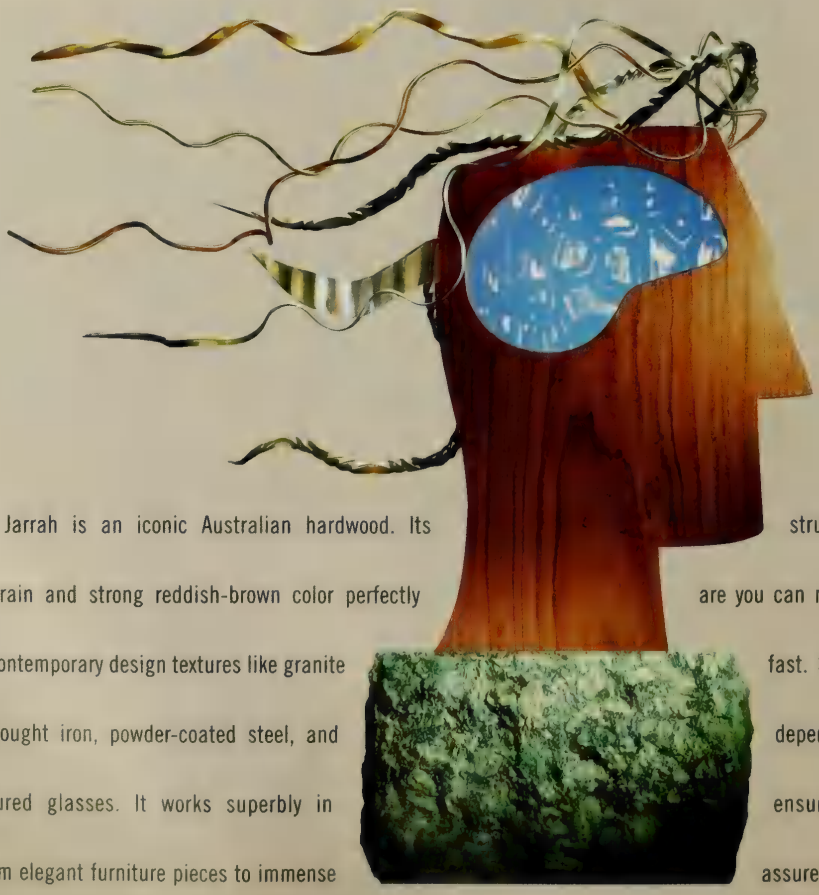






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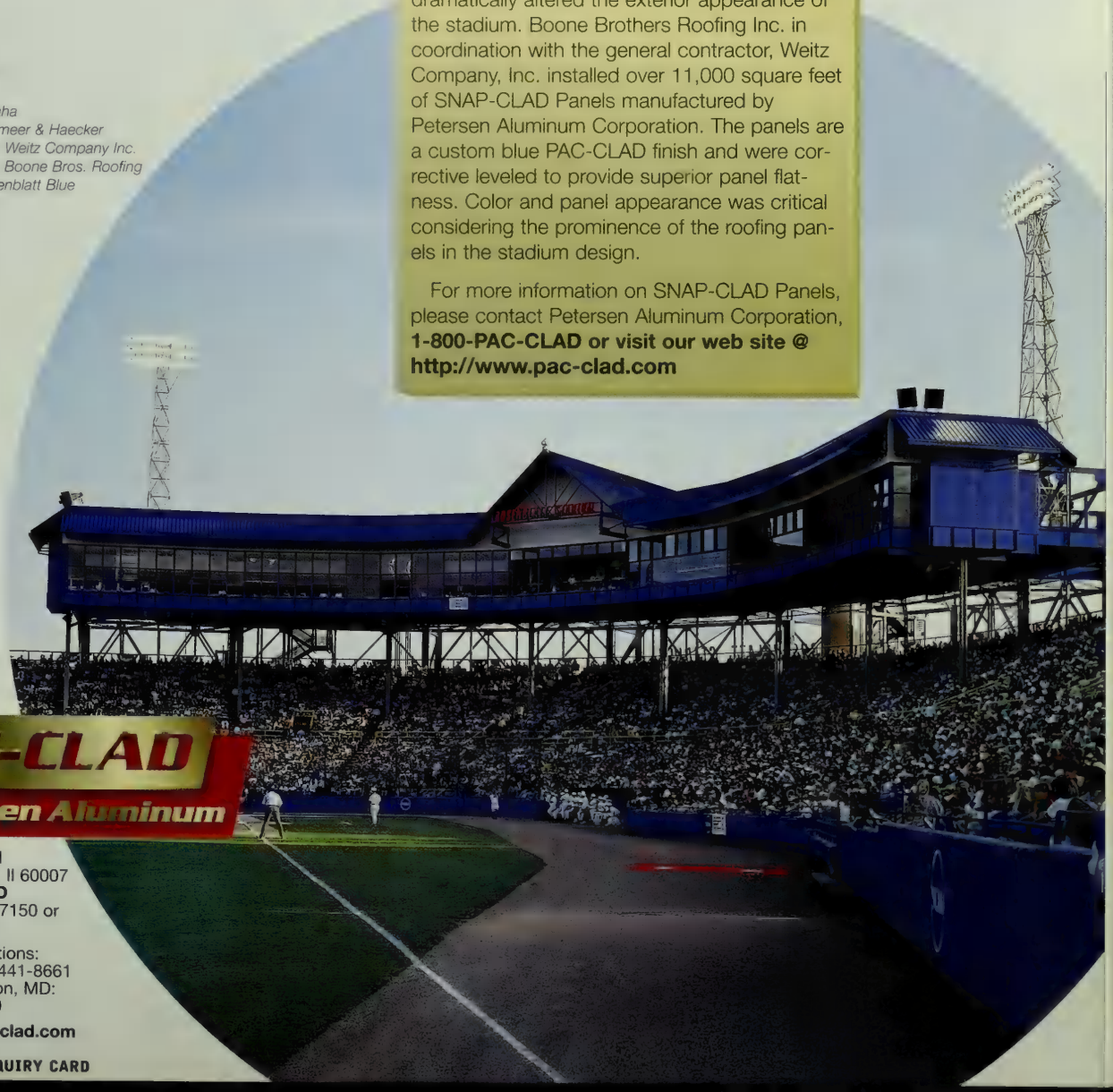
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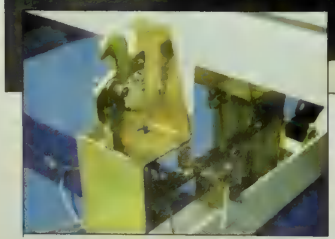
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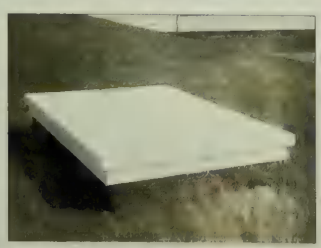
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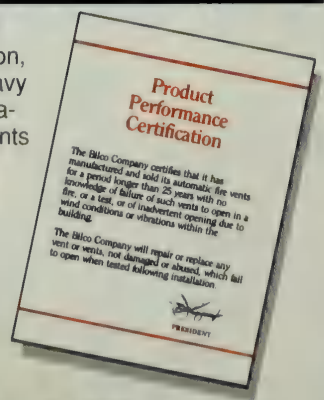


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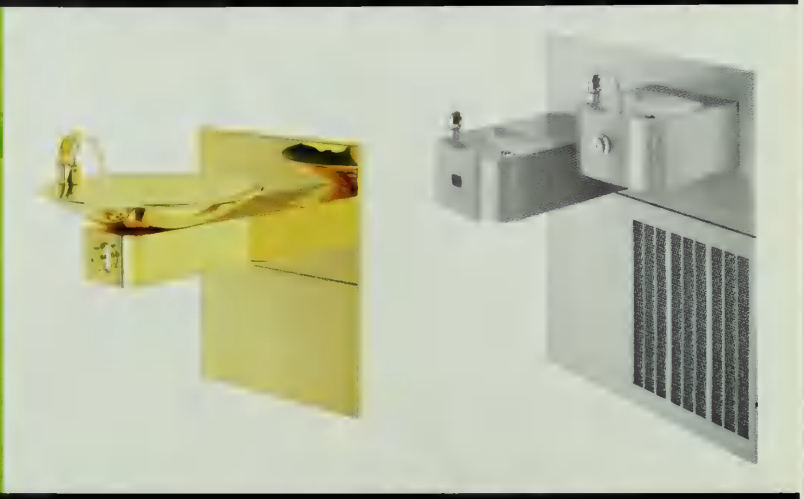
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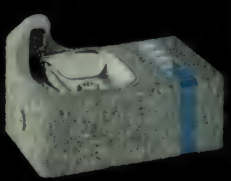




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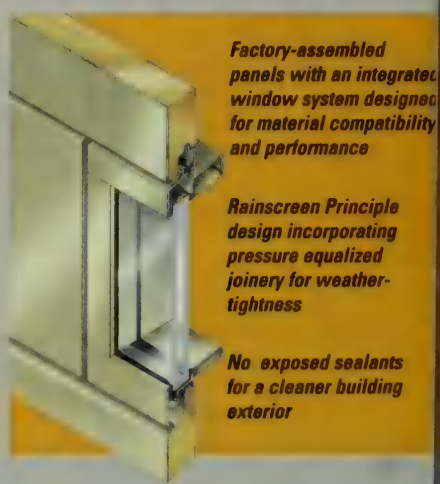


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ACADEMIC BUILDINGS

Reeducating the Masses

NEW AND RENOVATED BUILDINGS ON FIVE COLLEGE CAMPUSES FULFILL COMPLICATED PROGRAMMATIC REQUIREMENTS WHILE BRINGING HARMONY TO THEIR SURROUNDINGS.

by Charles Linn, AIA



1

Princeton University

McDonnell Hall, a physics laboratory, solves problems of scale, linkage, and circulation on a difficult site in the university's science complex.



2

University of Connecticut, Stamford

An entire campus is relocated to a remodeled Bloomingdale's, where the community and nearby corporations, as well as students, benefit from the move.



3

Bowdoin College

A new science building, Druckenmiller Hall, wraps around a lab building, preserving an existing quadrangle and presenting a new face to the public.



4

Emory University

The Center for Library and Information Resources mediates between Emory's traditional design vocabulary and an overpowering Modernist tower.



5

Southampton College

Chancellors Hall, a science building addition, is part of the first phase of a master plan that will impose order on a hodgepodge of roads and buildings.

Walk around almost any college campus that mixes buildings of various ages, and there will be two kinds of structures: those that go almost unnoticed because they fit in so well, and those that leap out because they ignore everything around them—massing, design vocabulary, scale, orientation.

One theme emerged from the work submitted for this Building Types Study: most of the prime building sites on campuses are gone. Some of the buildings that already exist next to "make-do" building sites don't work anymore. Some of them never did. To make the most of what is there, architects must approach the design of new structures warily, with the vision of master planners, ready to alter existing conditions that don't work and make the most of those that do.

At Princeton, Jadwin Hall, a physics building, was separated from Fine Hall, a math building, by a plaza that functioned somewhat like a vacant lot. College Walk seemed to dead-end there at two austere buildings. Gwathmey Siegel's new physics building, McDonnell Hall, with its refreshing palette of materials, encloses the plaza and provides a physical link between Jadwin and Fine Halls. The plaza now functions more like an enclosed courtyard, a destination point for College Walk.

Perkins Eastman's design for the University of Connecticut's Stamford facility had the most unusual program: to move an entire campus from the suburbs to the city center, where it would be closer to the students. Master planning here was crucial to assess the impact that moving the campus would have on the business district, and to assure that the results would be beneficial to the students and the community.

Druckenmiller Hall at Bowdoin College, in Brunswick, Maine, designed by Ellenzweig Associates, and the Center for Library and Information Resources at Emory University in Atlanta, by Shepley Bulfinch Richardson and Abbott, solve similar problems. They both build bridges, literally, to other buildings. The structure at Bowdoin respects the existing mix of styles; the one at Emory reestablishes the university's strong building vocabulary. Both preserve quadrangles by occupying unlikely sites.

Mitchell/Giurgola's new master plan for Southampton College, in Southampton, New York, is the most comprehensive of all. Old buildings will be remodeled, new ones will be added, and roads will tie together a campus that experienced a haphazard evolution.

Campus buildings should be like the courses that make up a curriculum. Each may be valuable on its own, but they must also work together to create a larger vision. ■

1 James S. McDonnell Hall Princeton University

A NEW BUILDING IN THE UNIVERSITY'S SCIENCE COMPLEX ATTACKS AWKWARD SITE, SCALE, AND CIRCULATION PROBLEMS.

by Kira L. Gould

Project: *James S. McDonnell Hall, Princeton University, Princeton, New Jersey*
Architect: *Gwathmey Siegel & Associates Architects—Charles Gwathmey and Robert Siegel, principals; Nancy Clayton, associate-in-charge; Richard Klibschon, project architect; Peter Brooks, Kang Chang, Bruce Donnally, Lance Hosey, Peter Juang, Christine Marriott, David Yum, project team*
Construction Manager: *Sordoni Skanska Construction Corp.*
Engineers: *Severud Associates (structural); Cosentini Associates (mechanical); Van Note–Harvey Associates (civil)*
Consultants: *Cosentini Lighting Design (lighting); Shen Milsom & Wilke (acoustical and audio-visual)*

Cost: *$10.4 million*

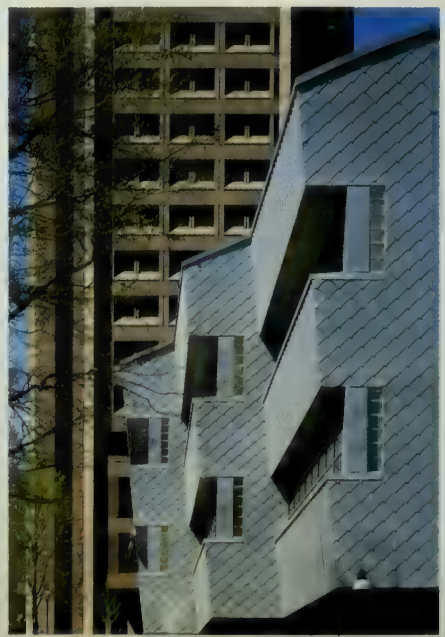
Sources
Brick: *Endicott, Taylor*
Modular cast stone: *Arriscraft*
Metal siding, shingles: *Rheinzink*
EIFS: *Dryvit*
Aluminum windows, doors: *Kawneer*
Glass: *Viracon*
Glass block: *Pittsburgh Plate Glass*
Wood doors: *Weyerhauser*
Lecture hall turntable stage: *Macton*
Rear-projection screens: *Da-Lite*
Acoustic ceiling and resilient flooring: *Armstrong*
Paints and stains: *Sherwin-Williams*
Lighting: *Louis Poulsen, Lightolier, Bega*
Hardware: *Best, Stanley, LCN, Von Duprin*

Princeton University's campus is lush, elegantly proportioned, and studded with signature buildings. It is not, however, without some physical discontinuity. For example, College Walk, a key pedestrian thoroughfare, had long crossed Washington Road, run between Jadwin Hall and Fine Hall, which made up Princeton's physics and math complex, and seemed to terminate rather unceremoniously in an underused plaza. This corner of the campus also featured differences in scale, materials, and orientation between the two buildings that called out for resolution.

Architects Charles Gwathmey, FAIA, of Gwathmey Siegel Architects, and associate-in-charge Nancy Clayton, AIA, understood immediately that the addition of the new James S. McDonnell Hall, a 42,000-square-foot classroom and laboratory facility that would complete the physics and math complex, was a chance to mitigate some of these problems. They also saw that the plaza could be used as an important gateway, especially given the proximity of Rafael Viñoly's new stadium, which stands just east of the plaza. "When you add a new building to an existing complex, the context must be engaged," says Gwathmey.

The building needed to contain classrooms, fully outfitted teaching theaters, and laboratories. Circulation spaces would also be very important; there are often up to 700 students in the complex at one time. This confluence of students points up one of the new structure's most significant roles: to be both a literal and a figurative conduit between two existing buildings.

Being the third building in a trio presents difficult problems of scale, and Gwathmey felt that the best complement to the looming red-brick Fine Hall tower and the horizontally oriented, four-story brown-brick Jadwin Hall would be a relatively low structure, which meant that something would have to go underground. Sinking the two teaching theaters nearly two levels below grade, the designers created a base, clad in light-and-dark alternating bands, on which other "objects" sit. A volume clad in cast stone contains five classrooms and service areas. The segment of the building that reads as most prominent contains the labs; it is rotated on-axis with College Walk and clad in standing-seam zinc panels and zinc shingles.



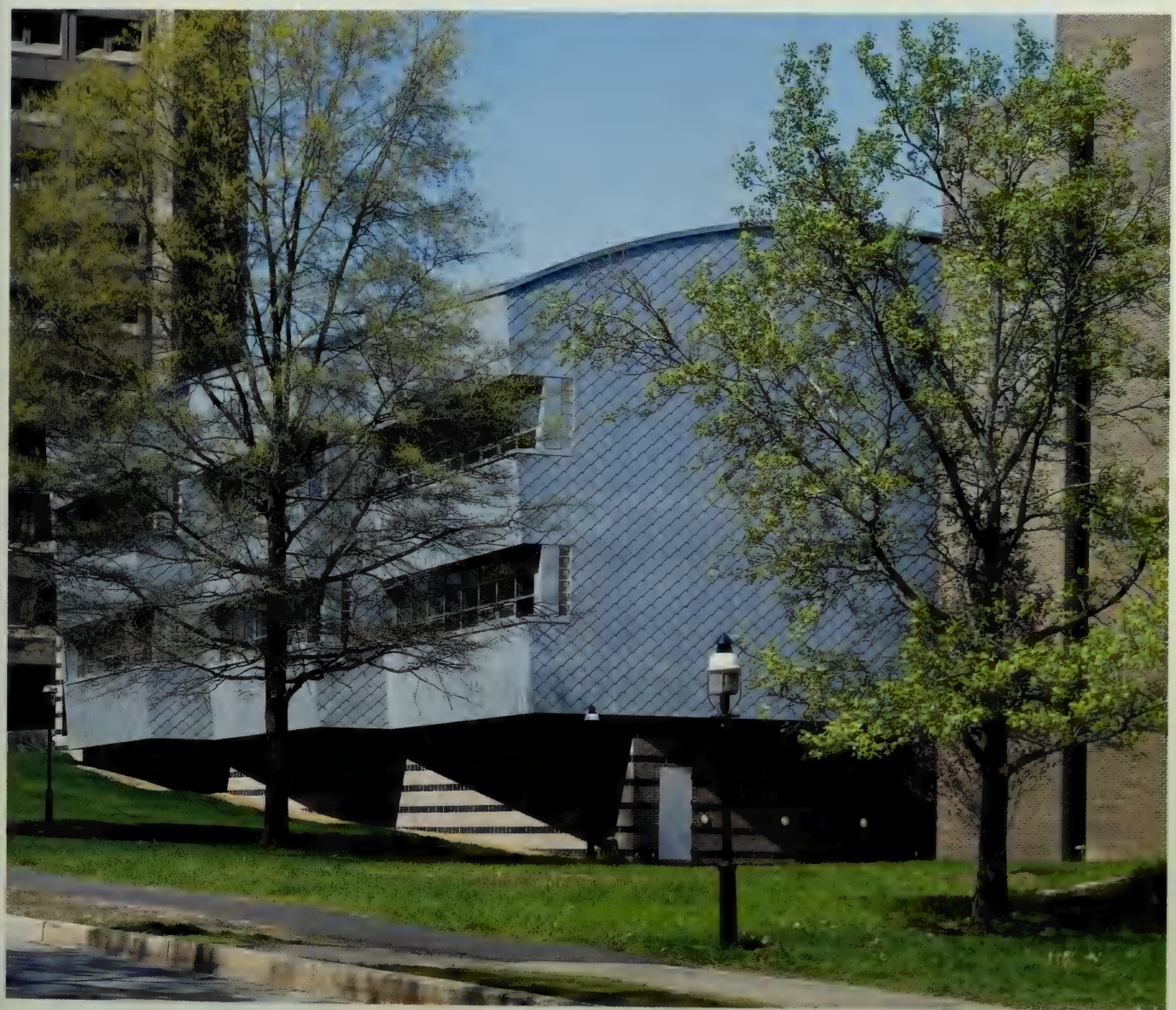
The most prominent portion of McDonnell Hall, containing the laboratories, is clad in zinc shingles. The Fine Hall tower is in the background.

Kira L. Gould is a freelance writer living in New York City.

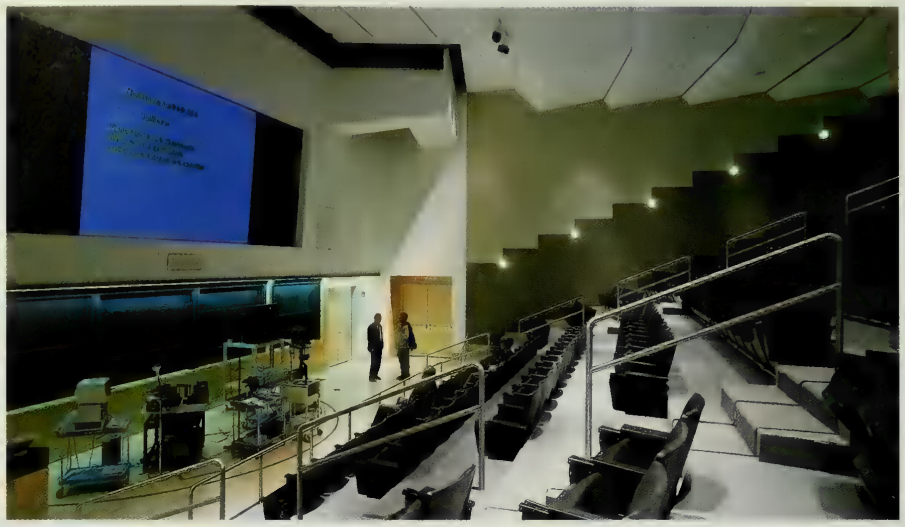


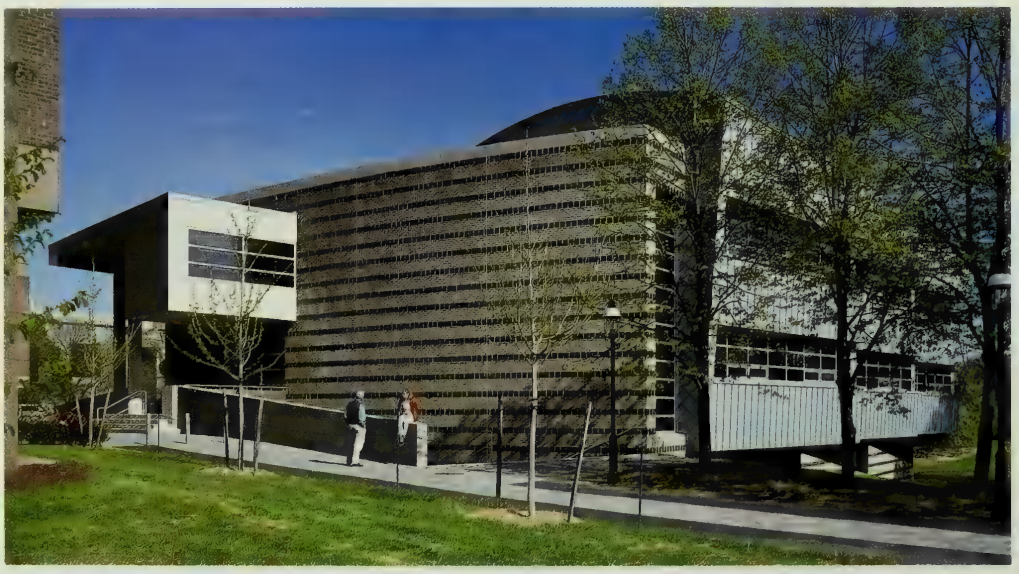
1. *McDonnell Hall*
2. *Fine Hall*
3. *Jadwin Hall*
4. *Cyclotron*
5. *Lewis Thomas Laboratory*
6. *Schultz Laboratory*

The teaching theaters reach two stories below grade. Above grade, they form a base clad in alternating bands of light brick and dark clay tile (below). McDonnell Hall creates a link between Fine Hall (left in photo) and Jadwin Hall (right).



Physics demonstrations are set up on a turntable (right), which rotates 180 degrees at the push of a button. This allows one demonstration to be prepared while another is being performed. Bands of brick and tile wrap the north elevation (below), which abuts the cast-stone-clad classroom block. A bright blue steel column supports the entry canopy (bottom).



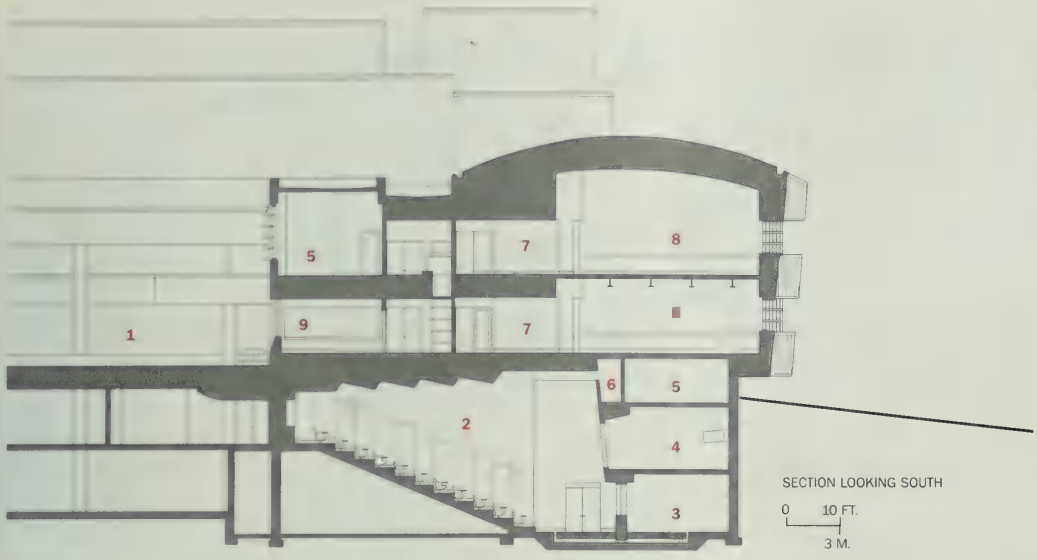




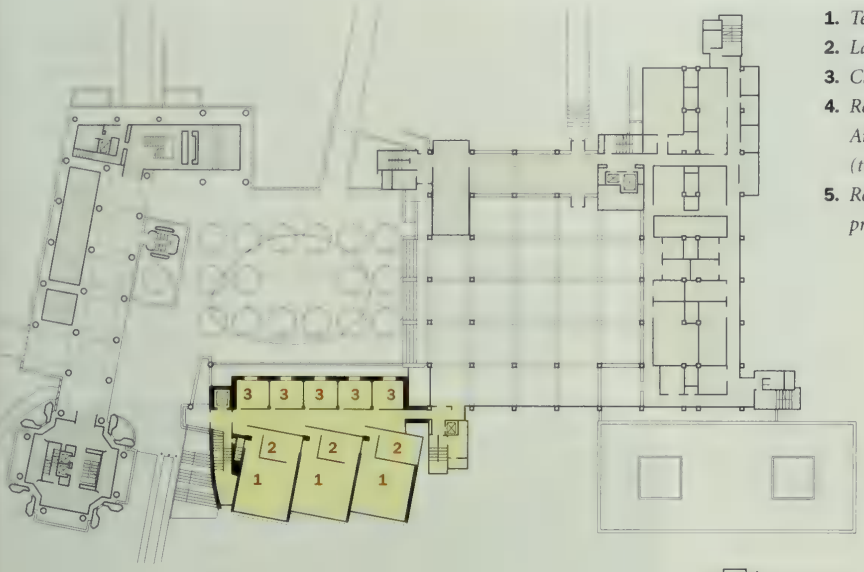
A canopy signals the entrance to an atrium that affords access to classrooms and laboratories and connects the new structure to Jadwin Hall. An exterior stair leads to a below-grade secondary entrance; here a 6,000-square-foot gallery serves as a surprisingly light lobby area for the two new lecture theaters.

The committee of physics department representatives that reviewed the design throughout the project became fascinated by the architectural process. "It's one of the reasons we love university projects," Gwathmey says. "People who are very committed to their own disciplines typically appreciate ours, our commitment to it, and the process it yields—even when it's not a linear one. We explain the process, rather than rationalizing its results."

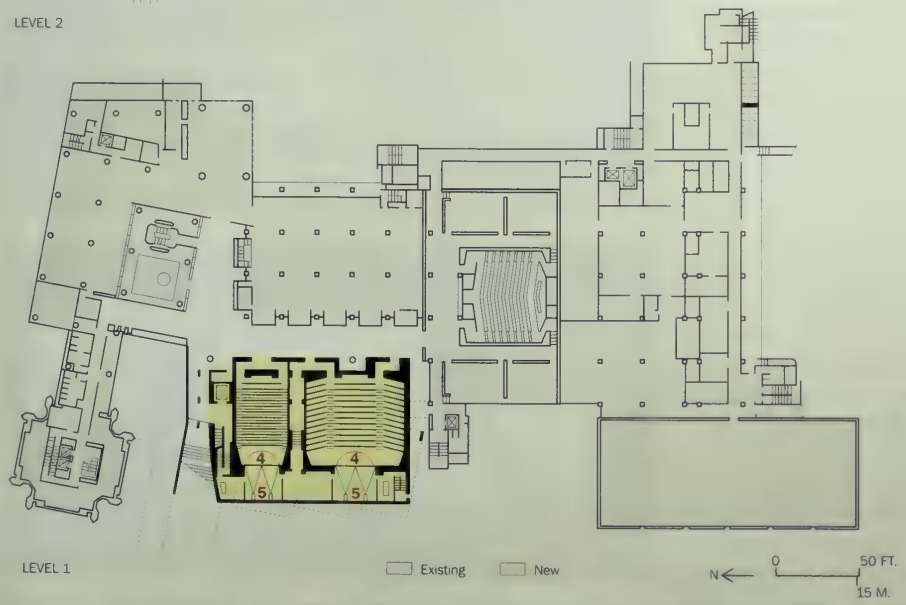
The architects and the committee investigated the program requirements together. A visit to Johns Hopkins University convinced the committee that turntable stages could revolutionize class scheduling; the elaborate preparation for one class can take place while another is under way. At the push of a button, the circular platform that's flush with the stage rotates 180 degrees. In the more intimate, loftlike laboratories, a barrel-vaulted ceiling allows experiments that involve light and accentuates the airy quality of these



1. *Plaza*
2. *Reynoldo Auditorium*
3. *Lecture prep*
4. *Rear-screen projector room*
5. *Mechanical*
6. *Catwalk*
7. *Vestibule*
8. *Corridor*
9. *Classroom*



LEVEL 2



1. *Teaching labs*
2. *Lab classrooms*
3. *Classrooms*
4. *Reynoldo Auditorium (turntable in floor)*
5. *Rear-screen projector room*

rooms; daylight can be softened or eliminated by lowering a double-layer shading device on the west-facing windows.

Throughout the building, the connection with what's outside is refreshing. But it's precisely because the brick wall of Jadwin is visible from the hallways leading to the labs that the visitor feels the relationship of structure to site. Each element seems to support what comes next; there is a sense of discovery and memory at work as one walks through the building.

This new building, while connecting Fine and Jadwin Halls, might have proven a further barrier to College Walk had its designers not taken care to make the entry to the courtyard commodious. More important still is the blue column that supports the entry canopy: it serves as a quiet rather than brash beacon from within the court area.

But whether College Walk will ever really land in a friendly place before feeding onto its next leg to the stadium is not yet known. A graceful and assertive Calder stabile anchors the courtyard, and Gwathmey's team drew on its aesthetic to design a soft, irregular oval shape for the lawn. Work will begin next year on the landscaping, and McDonnell's stone-clad wall will one day be covered with ivy. For now, the restorative power of this structure is only a promise. ■

2 Stamford Campus of the University of Connecticut

MOVING A SUBURBAN CAMPUS DOWNTOWN SERVES EDUCATIONAL NEEDS WHILE BRINGING NEW LIFE TO THE COMMUNITY.

by Philip Langdon

Project: *Stamford Campus of the University of Connecticut*
Architect: *Perkins Eastman Architects—Bradford Perkins, FAIA, and Aaron B. Schwarz, AIA, principals; Nicholas Leahy, senior associate; Joel Brown, Neville Epstein, Charles Williams, associates; Victor Tesler, Tony Beaumont, Nick Leko, Stephen Matkovits, Joseph Bula, Quincy Nixon, Salvador Pena, Carlo Panfilo, Cono Dizeo, Kathryn Atti, Chris Yoon, Sari Kronish, Daniel Russell, Ekkehard Schmid, Jonathan Neil, project team*
Associate Architect: *Dubose Associates*
Engineers: *Cosentini Associates (mechanical); Purcell Associates (structural); Allan Davis Associates (civil)*
Consultants: *Advanced Structures Inc. (structural glazing); Scott B. Page (program); Jack Curtis & Associates (landscape); Chermayeff & Geismar (graphics); Donegan & Associates (consulting architect); Ann Kale Associates (lighting)*

Cost: *$40 million*

Sources
Uninsulated metal panel: *Alply*
Insulated metal panel: *Criterion*
Glass curtain wall: *Pilkington*
Aluminum windows: *Vistawall, Pilkington*
Insulated glass: *Pilkington, Viracon*
Skylights: *Architectural Skylight*
Glass entrance doors: *Blumcraft*
Cherry veneer doors: *Weyerhauser*
Lighting: *Zumtobel, Bega*

What can a city do to bring a university closer to the community it serves? For nearly a decade, a coalition of business executives, political leaders, nonprofit groups, lawyers, faculty members, and citizens had prodded the University of Connecticut to move its Stamford branch from an outlying, mostly residential area into the city's downtown, the home of the largest concentration of corporate offices in Connecticut. A downtown campus, they reasoned, could both accommodate the spatial needs of the school and serve as a conference center for the city's corporations.

The logical spot for the new campus, the coalition and the university eventually agreed, was at a busy intersection on the western edge of downtown, where a 1953-vintage Bloomingdale's store, which had stood vacant since the late 1980s, looked ripe for renovation. Aaron B. Schwarz, AIA, a principal at Perkins Eastman Architects, explains that one of the attractive aspects of the site was that the structural frame of the old department store could become a modern educational facility in a very short time. In addition, the store's original parking garage, located nearby, could be reused.

New Haven writer Philip Langdon's most recent book is A Better Place to Live: Reshaping the American Suburb.

"We stripped the department store to its concrete frame," says Schwarz. "The brick skin of the building was peeled off. All that was saved was the structure and floor slabs." The decision to salvage the building's frame and foundation was based more on saving time than on saving money. Retaining some of the original structure enabled the project to be classified as a renovation, thereby avoiding a complicated regulatory process that would have added months to a tight design and construction schedule. The 20-foot grid of the former department store now accommodates a large range of new educational facilities—a library, auditoriums, classrooms, science labs, computer labs, a fitness center, an art studio,

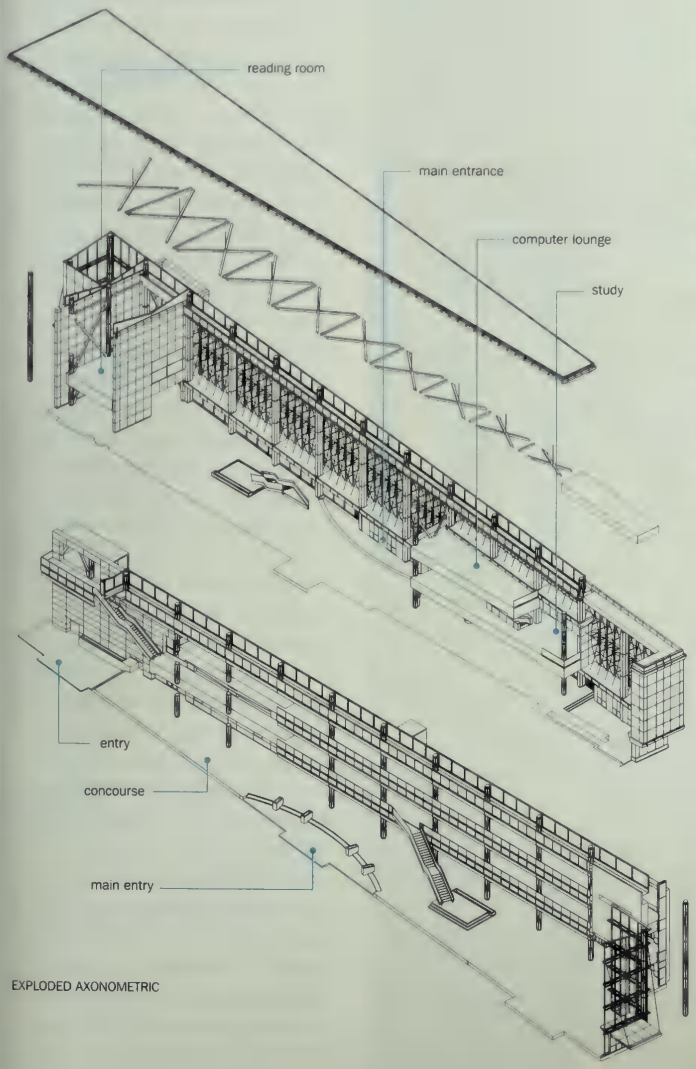
The academic concourse occupies the glazed space at the front of the building (below). Offices and classrooms occupy the rear (bottom).







1. *Stamford Campus building*
2. *Parking garage*
3. *Franklin Plaza*
4. *C. L. "Whitey" Heist Park*
5. *Rippowam River*
6. *St. Andrew's Church*



EXPLODED AXONOMETRIC



Light spines are covered with sloped glass (left in photo); the concourse is a new public space (right in photo).

a conference center, food service areas, and administrative offices—all in one three-level, 253,000-square-foot building, and all on a $40 million budget.

Reusing the structural system allowed work to proceed quickly. A master plan that analyzed the effects of moving the campus downtown was begun in January 1995, design began three months later, demolition started that summer, approval for the start of construction was granted in the fall of 1996, and staff started moving into the building in January 1998 when it was 75 percent complete. In August workers were still taking care of final touches, such as installing metal enclosures on some of the columns.

One of the most interesting challenges of the project was figuring out how to dramatize the school's presence in downtown Stamford. While it's true that the city no longer treats pedestrians as haughtily as it did in the 1970s, when it allowed companies to build headquarters buildings that featured better connections to parking garages than to public sidewalks, the image-conscious corporate culture of this city of 111,000 still craved a sleek, impressive exterior for the university.

Perkins Eastman satisfied the potentially conflicting desires for a glossy corporate-style image and a

The academic concourse can function as a space for large public gatherings or a relaxing study spot.

1. *Entrance*
2. *Concourse*
3. *Library*
4. *Bookstore*
5. *Conference center entrance*
6. *Light spine*
7. *Auditorium*
8. *Classroom*
9. *Multiuse area*
10. *Mechanical*



FIRST FLOOR



pedestrian-friendly setting by inserting a spacious new public area—called the "academic concourse"—along the entire 400-foot-long front of the building, immediately adjacent to the sidewalk.

The concourse, which features angled stairways leading to seating areas at various locations along the upper levels, is envisioned as a setting for public functions and a place where students at the commuter college may choose to linger. "After class, you don't have to run to your car," Schwarz says. "You can stay, read a book. I hope it will become more of a place for the community."

The building's face is essentially a wall of glass punctuated by the metal-paneled volume of the student services area and by an angled wall of translucent white windows at the southeast corner, diffusing light into the reading rooms. "We wanted to turn the building inside out," explains Schwarz, "to get a lot more transparency, to get more views into the building. The idea was that this is not an ivory tower." The green-tinted glass system manufactured in England by Pilkington is 60 feet high and is supported by a stainless-steel catenary-curve truss, which eliminated the need for mullions between the panes.

In contrast to the bright expansiveness of the concourse, the

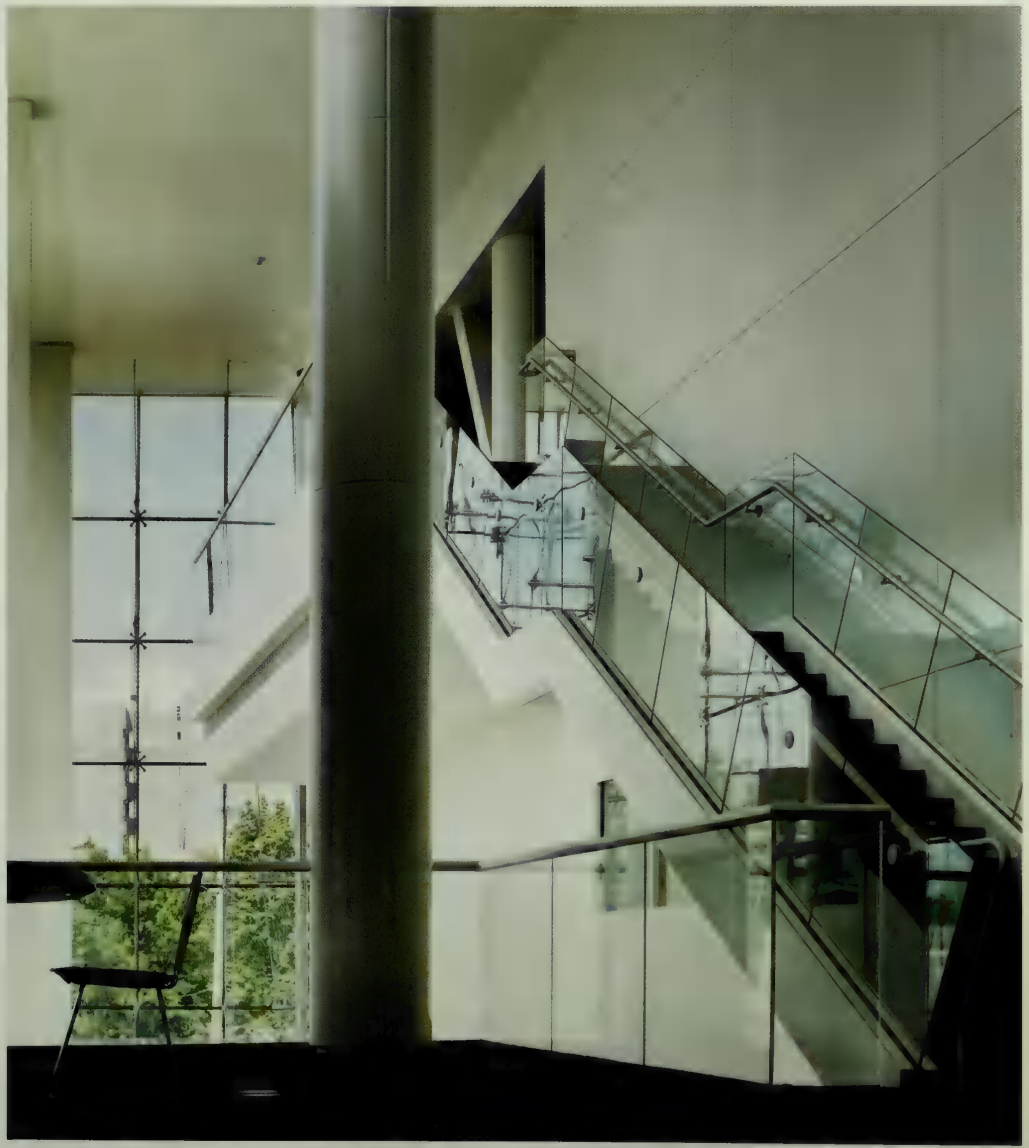




Study lounges (left) are located beneath one of the building's two light spines. A stainless-steel catenary-curve truss supports the exterior glass wall of the concourse, eliminating the need for mullions (far left and below).

areas holding classrooms and offices are somewhat mazelike. To counteract the confusion that such large, subdivided interiors often cause, Perkins Eastman used daylight as an orientation device. They carved two skylit alleys—each one column bay wide—out of the building's structure. Both narrow atria, covered by sloping glass roofs, run parallel to the front concourse and extend half the length of the building. One of these "light spines" starts at the west end of the building and the other at the east end. They are set apart from each other by two column bays.

Adjoining the building is the new C. L. "Whitey" Heist Park, which was built as part of the master plan to be an amenity not only for students but for the city as a whole. Dr. Curtiss Porter, the campus's interim director, credits the building, and the organizational work that preceded it, with stimulating valuable partnerships and relationships between the university and the city's corporate sector. In addition to the state's contribution, $10 million was raised from corporate and private sources. Enrollment could jump from the equivalent of about 825 full-time students at the old campus in 1994 to 1,331 at the new campus by 2005. Eventually, the university may have to obtain more space. But for now, says Schwarz, "it's a universe in a building." ■



3 Druckenmiller Hall Bowdoin College

A NEW SCIENCE BUILDING WRAPS AROUND AN EXISTING ONE TO PRESERVE A VITAL GREEN SPACE AND TO ENCOURAGE INTERDISCIPLINARY LEARNING.

by Elizabeth Kubany

Project: *Stanley F. Druckenmiller Hall, Bowdoin College, Brunswick, Maine*
Architect: *Ellenzweig Associates, Inc.—Harry Ellenzweig, AIA, design principal; Michael Reagan, AIA, principal-in-charge; Charles Kirby, AIA, Peter Sugar, project managers; Tom Kahmann, assistant project manager; Yahya Jan, project architect*
Consultants: *LeMessurier Consultants (structural); BR+A/Sullivan Partnership (mechanical/electrical); Nancy Hackett (interior design); Jerry Kugler Associates (lighting); R. W. Sullivan (plumbing, fire protection); Carol R. Johnson Associates (landscape)*
General Contractor: *Suffolk Construction Company*

Cost: *$11.8 million (new construction); $4 million (renovation)*

Sources
Masonry: *Glen-Gery*
Curtain wall, aluminum doors and windows, skylights: *EFCO*
Roofing: *Carlisle*
Fire-control doors: *Won-Door*
Hardware: *Schlage, Von Duprin*
Acoustic ceilings: *Armstrong*
Suspension grid: *Chicago Metallic*
Paints and stains: *Benjamin Moore*
Plastic laminate: *WilsonArt*
Solid surfacing: *Fountainhead*
Floor tile: *Dal-Tile*
Resilient flooring: *Armstrong*
Carpet: *Lees*
Furniture: *Nienkämper, Johnson Tables*
Fixed seating: *Kreugar International*

In the words of Harry Ellenzweig, principal of Cambridge-based Ellenzweig Associates, the campus of Bowdoin College, a four-year liberal arts college, is "gentle" and its architecture is a "mosaic of styles." Bowdoin's president, Robert Edwards, echoes Ellenzweig's sentiment when he calls the campus "ancient and beautiful" and its mostly low-scale array of buildings "delicate."

In 1802, eight years after the college was chartered, the Federal-style Massachusetts Hall, designed by Aaron and Samuel Melcher III, opened as the school's first building, which then had 29 students. Today, with the student body numbering approximately 1,500, the buildings on campus represent a wide variety of eras and styles: German Romanesque (by Richard Upjohn), Colonial (by Allen and Collens), Medieval and Gothic Revival (by Henry Vaughan), and modern (by Edward Larrabee Barnes and Hugh Stubbins), as well as neoclassical, neo-Georgian, and even postmodern.

Edwards describes the mandate Ellenzweig was given—to design a large new science center without destroying the subtle unity of the campus—as a "very difficult architectural brief." The location

New York City writer Elizabeth Kubany is an occasional contributor to ARCHITECTURAL RECORD.





Druckenmiller Hall's main entrance (top) has replaced a loading dock as the public face the science complex presents to Sills Drive and the surrounding community. The architects used large expanses of glass at the corners of the addition to diminish its apparent size and impact (above and opposite).



1. *Druckenmiller Hall*
2. *Cleaveland Hall*
3. *Hatch Science Library*
4. *Entry*
5. *Gymnasium*
6. *Bowdoin pines*
7. *Service entry*

A glazed bridge connects Druckenmiller Hall (right in photo) with the existing Hatch Science Library.

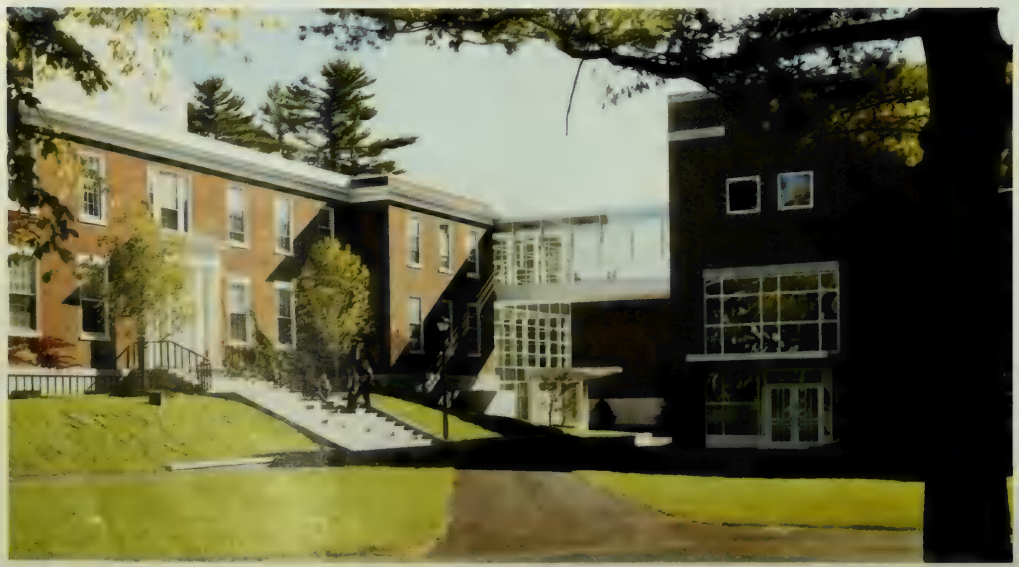


The building's new service entry has a less public location (below). Cleaveland Hall's main facade as well as the quad in front of it (bottom) would have been covered up by an earlier scheme for a new building.

1. *Lobby display*
2. *Classroom*
3. *Loading dock*
4. *Faculty office*
5. *Research laboratory*
6. *Teaching laboratory*
7. *Lecture hall*







chosen for this new center was the northeastern corner of the campus, where a U-shaped quadrangle is surrounded by a grove of Bowdoin pines. One of the larger open green spaces on the campus, the quad is bounded on the north by Sills Hall and Smith Auditorium, both designed by McKim, Mead & White in 1950; on the east by Cleaveland Hall, also designed by McKim, Mead & White, in 1951; and on the south by the Hatch Science Library, a 1991 building by Shepley Bulfinch Richardson and Abbott. Opening to the west, the quad provides access to Bowdoin's main quadrangle and the remainder of the campus and helps to set the campus's edge.

The original design for Druckenmiller Hall—scrapped because of an unrealistic price tag—was a large rectangular building to the west of Cleaveland Hall. It would have occupied more than half of the quadrangle, walling off this portion of the campus and presenting an unfriendly face to the college's surrounding community.

Ellenzweig's design saves the quadrangle, a vital open space, by making Druckenmiller Hall, in effect, an addition to Cleaveland Hall. Wrapping around the east and south sides of Cleaveland, which was renovated as part of the project, Druckenmiller also provides a connection to the Hatch Science



1. *Bridge*
2. *Study area*
3. *Teaching laboratory*
4. *Greenhouse*
5. *Research laboratory*
6. *Animal facility*
7. *Instrument laboratory*
8. *Atrium (below)*
9. *Cold room*

An atrium serves as a study lounge (below left). A greenhouse (below right) occupies one corner of the addition's top floor.

Library via a glazed, third-level bridge.

As a welcoming gesture to Sills Drive and the neighboring community, Druckenmiller's main entrance is located along the east facade, an area that was previously dominated by a parking lot and service entries. Like other buildings at Bowdoin, the hall is clad predominantly in red brick. But because a 76,000-square-foot building clad entirely in masonry would have overwhelmed the rest of the campus, the architect mitigated the structure's impact by providing generous glazing at each corner. The use of glass gives the building a warmer, more inviting look.

Glazing also helps to integrate the new building with the surrounding structures; the new glass corner entrance and bridge that project from the east side of Cleaveland Hall do not distort the older building's neoclassical symmetry. Different glazing applications distinguish the entrances, greenhouse, offices, lounges, and conference rooms from the classroom/laboratory blocks, which are expressed on the exterior in brick. Throughout the day, the glazing reflects the pine trees, while at night, when the building is illuminated from within, it helps to make Druckenmiller a beacon on the campus.

Besides the difficult site issues it resolves, the building also enhances the school's innovative approach to the teaching of science. Recognizing that successful scientific research often occurs across the boundaries of traditional disciplines such as chemistry and biology, an advisory committee, made up of Bowdoin faculty, decided that Druckenmiller Hall's program should follow suit by breaking down traditional departmental barriers. The building promotes interdisciplinary learning through interaction and collaboration among researchers and students and provides the flexibility to reconfigure spaces and to centralize shared spaces.





Although each individual department occupies its own area of the building—biology along the east side; chemistry on the west side, in the renovated Cleaveland Hall; and geology/environmental studies on the south—"the building is designed so that we all walk past each other all the time," according to Tom Settlemire, associate professor of biology and chemistry. The L-shaped configuration of Druckenmiller Hall, wrapped around the existing Cleaveland Hall, forms a skylit, two-story atrium, where people can meet to socialize and study. Strategically located informal meeting places encourage happenstance gatherings and discussions.

Research labs, with movable partitions for flexibility, have been designed as open, double modules to facilitate interaction among research teams, both within the same department and between different departments, and to allow interchangeable biology or chemistry instruction.

Overall, Ellenzweig's Druckenmiller Hall takes an open and airy approach that makes the campus more welcoming and the sciences more friendly. There has already been at least one happy side effect: biology has become the college's second most popular major. ■

4 Center for Library and Information Resources Emory University

A LIBRARY BUILT FOR THE INFORMATION AGE BRIDGES A CAMPUS'S DESIGN TRADITION, A RAVINE, AND A TALL CONCRETE NEIGHBOR.

by Mia Keilor

Project: *Center for Library and Information Resources, Emory University, Atlanta, Georgia*
Architect: *Shepley Bulfinch Richardson and Abbott—H. Jan Heespelink, principal-in-charge; Geoffrey T. Freeman, principal, library planning and design; Ralph T. Jackson, principal/project designer; Wendell E. Wickerham, library planner/project manager; Tang-Xian Xu, project architect; Kelly Jerome Monnahan, project designer, interiors*
Associate Architect: *Tippett Clepper Associates—Rohit Saxena, principal-in-charge*
Engineers: *Newcomb and Boyd (mechanical, electrical, plumbing); Jack Lynch & Associates (structural); LRE Engineering (civil)*
Consultants: *Hughes Good O'Leary and Ryan (landscape)*
General Contractor: *Beers Construction, Inc.*

Cost: *$10.2 million (new construction)*

Sources
Aluminum curtain wall: *YKK*
Built-up roofing: *Firestone*
Copper roofing: *RTS, Inc.*
Low-e glass: *Viracon*
Acoustical ceilings: *U.S. Gypsum*
Elevators: *Schindler*
Lighting: *Staff, Litecontrol, Visa, Louis Poulsen*
Plumbing fixtures: *American Standard*
Hardware: *Russwin, Corbin, Hager, LCN, Von Duprin*
Lighting controls: *Lutron*

Most of the buildings on the Emory University campus follow a relatively simple formula. They are rectangular in massing, three stories tall, and their structure is characterized by straightforward load-bearing walls. Full-height arched windows are repeated as a theme throughout the buildings, and broad overhanging eaves support red clay-tile roofs. Exterior walls are local pink and white marbles laid up in orderly courses, although the stone's wild veining gives each row its own unique patchwork pattern.

The university gave Shepley Bulfinch Richardson and Abbott (SBRA) the task of integrating the functions of the Candler Library, among the earliest buildings on Emory's original 1919 quadrangle, with the Brutalist 10-story Woodruff Library, designed in 1969 by Warner Burns Toan Lunde. The new building needed to physically mitigate this difference of seven stories in scale, bridge a deep gorge, and redirect attention into the original quadrangle, as well as consolidate Emory's academic computing, media, and traditional library functions into a single library complex.

SBRA's new building, the Center for Library and Information Resources (CLAIR), unlike the other quad buildings, is not freestanding. Instead, it is connected on its north side by a bridge to Candler Library, and at ground level to Woodruff Library on the south. SBRA deferred to Emory's traditional vocabulary of forms and materials in the design of the center, and the building seems as if it has always been there. CLAIR matches the massing of other buildings on the quad, and its skin is detailed with the same pink and white marbles.

CLAIR's plan is figured as a chamfered drum; its north-south axis is aligned with a central axis that runs through both Candler and Woodruff. To the east, the building is set back from Asbury Circle, a campus drive, and to the south it is set back from the original quad. This leaves a space for gardens on both the north and south sides of the building; designed by landscape architects Hughes Good O'Leary and Ryan, their main feature is a deep ravine formed by Peavine Creek. The creek flows beneath the east side of the center and emerges on the west from beneath a stone arch built into the rusticated base. A balcony overlooks the garden, which has been planted

The Center for Library and Information Resources (center in photo below) joins the traditional Candler Library (foreground) with the Brutalist Woodruff Library (background), and bridges a deep ravine (opposite, right). Major library functions are grouped around a two-story lobby (opposite, left).



Mia Keilor is a freelance writer living in Atlanta.



1. *Candler Library*
2. *Bridge*
3. *Center for Library and Information Resources*
4. *Woodruff Library*

The section (below) shows the relationship between the existing libraries and the ravine that divided them. The new center (bottom) bridges the gap between the buildings.



informally with native trees and shrubs.

Students enter the new facility from under a pair of canopies, one on each side of the bridge between Candler and CLAIR, into a two-story lobby. The center's departments are zoned rather than compartmentalized, creating a functional openness: periodicals and technical services are located on the ground floor; the reference and business libraries are located on the second level; and circulation, new books, and the reserved reading room are located on the third level. A new computer network is accessible throughout the building and is flexible enough to evolve over time with a minimal number of disruptions.

SBRA's Center for Library and Information Resources solves a number of site and programmatic problems by linking a new building with two older ones. The result is a solution that extends itself to a distinguished campus on many levels, not a single idea isolated inside a cube. ■





5 Master Plan and Chancellors Hall Southampton College

A CAMPUS MAKEOVER WILL CONSIST OF A NEW SYSTEM OF ROADS, A SPRINKLING OF NEW BUILDINGS, AND A SERIES OF BUILDING RENOVATIONS.

by Charles Linn, AIA

Project: *Master Plan and Chancellors Hall, Southampton College, Long Island University, Southampton, New York*
Owner: *Long Island University*
Architect: *Mitchell/Giurgola Architects—Paul Broches, FAIA, principal-in-charge; John Kurtz, AIA, project principal; Virginia Kindred, project architect; Miguel Rivera, AIA, project manager; James Braddock, AIA, lab planner/designer; Stuart Crawford, AIA, Tilman Globig, Carl Gruswitz, project team*
Engineers: *Atkinson Koven Feinberg Engineers (mechanical, electrical, plumbing); Severud Associates (structural); S. L. Maresca & Associates (civil); Sear-Brown Group (site, civil)*
Consultants: *George C. Lynch (landscape); Acoustilog (acoustical); Inter-Science Research Associates (environmental); Macro-Gorton Associates (owner's representative)*
General Contractor: *Racanelli Construction Company*

Cost: *$6.5 million*

Sources
Custom copper shingles: *Superior Sheet Metal & Siding*
Built-up roofing: *Schuller*
Metal roofing: *ARS*
Aluminum curtain wall, doors, windows: *Kawneer*
Low-e glass: *Solex*
Wood doors: *Weyerhauser*

Southhampton College, in Southampton, New York, is part of the Long Island University (LIU) system, the second largest independent, not-for-profit university in the state. In addition to Southampton, LIU has two other campuses—one in Brooklyn and one in Brookville (the C. W. Post Campus)—and operates several smaller academic centers.

Southampton was founded in 1963 on the site of the Claflin estate, whose former main residence is still used as the college's administration building. The site is bucolic, occupying one of the larger open areas in what has become among the wealthiest and most popular vacation enclaves in the New York City region.

Since 1975 Southampton College has produced 28 Fulbright scholars; its Friends of the World Program for education and social change operates academic centers in seven locations around the world. And the college's proximity to the ocean provides rich potential for its marine biology program.

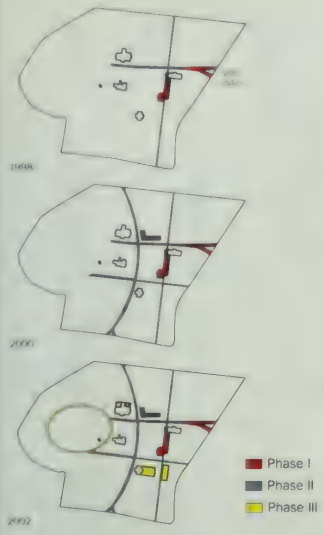
Few visitors would guess the extent of this small college's achievements by casually looking the place over. The campus's buildings look like they were dropped from an airplane passing overhead, and the roads built around them. Vehicle access to the residence halls seems to have been planned more for the movement of trash trucks than for students with cars. The existing buildings have a certain charm but look worn. Working in Southampton's favor, however, are its well-manicured lawns and mature stands of trees.





Chancellors Hall includes an academic wing (left in photo above) and a radio station (right in photo). An aerial perspective (below) shows how proposed roads would impose a sense of order on the campus.

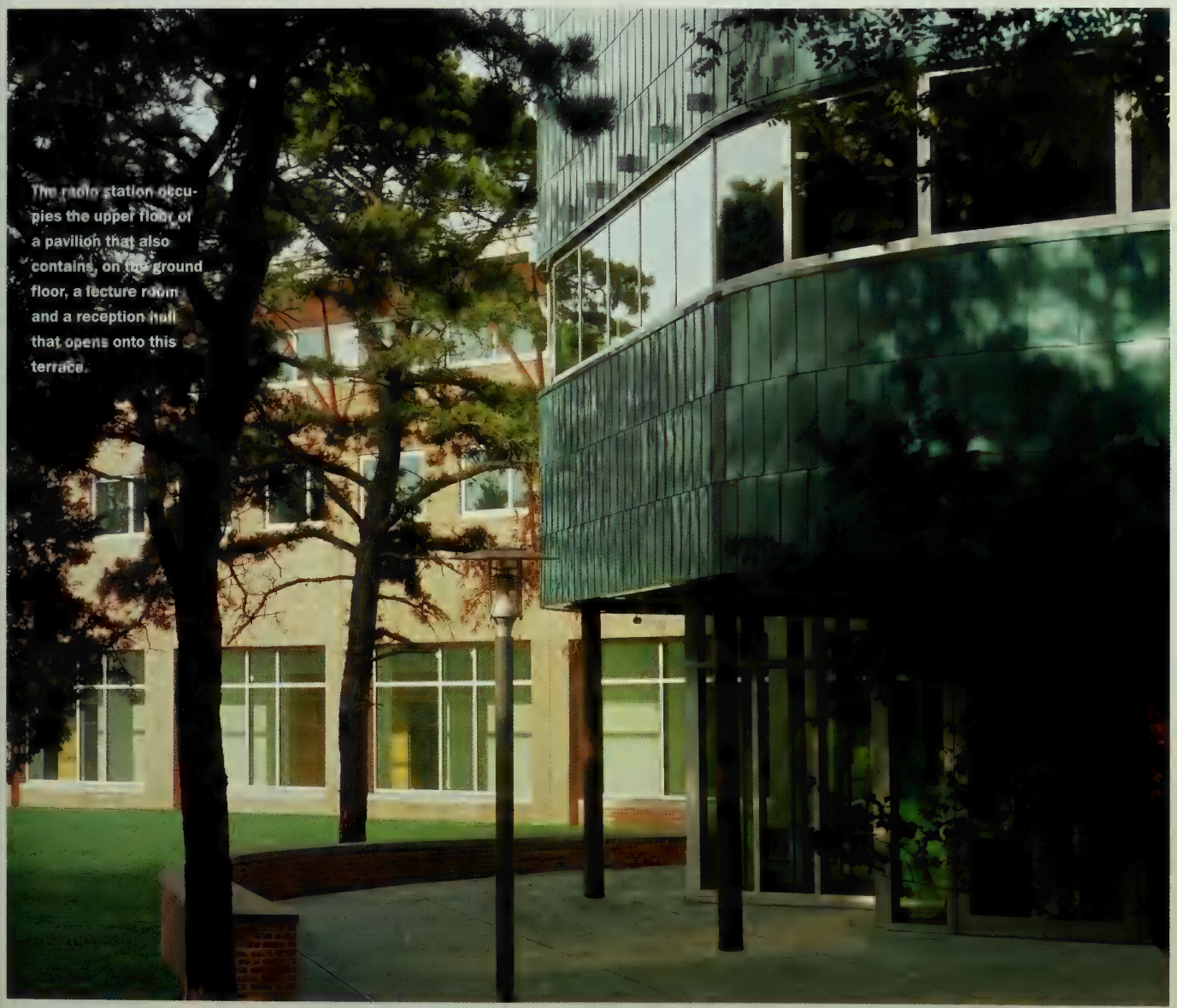
"Unfortunately, it hasn't been a place where a high school senior might drive around with his or her parents, and say, 'Yes, this is where I want to spend the next four years,'" says Paul Broches, FAIA, of Mitchell/Giurgola Architects, the firm's partner-in-charge of a new master plan for Southampton College. Mitchell/Giurgola is also the architect for the Long Island



Chancellors Hall, the first phase of the project, is complete. In the second phase a new student center will be built and Southampton Hall, the administration building, will be renovated. In the third phase the student center will be enlarged and made into a library, the existing library will be converted into art studios, and the new dorms and fitness complex will be built.

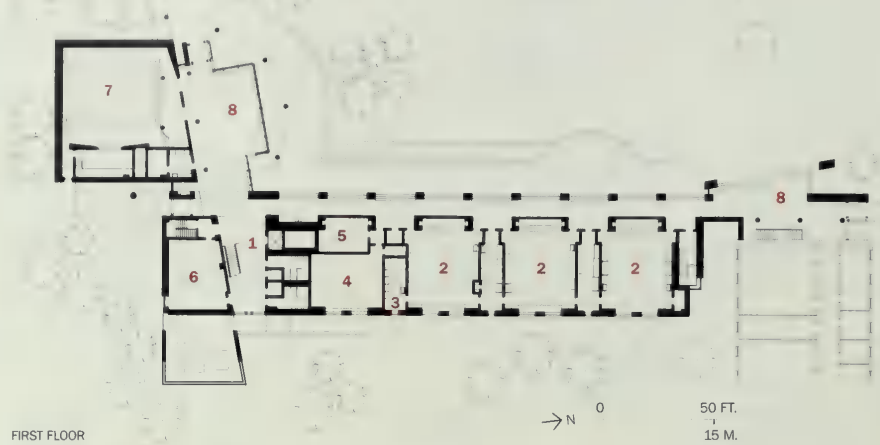


1. *New physical fitness complex*
2. *Wood Hall (existing student center)*
3. *New student center*
4. *Southampton Hall*
5. *Chancellors Hall*
6. *Art cottages*
7. *New dormitory*
8. *Existing library*



The radio station occupies the upper floor of a pavilion that also contains, on the ground floor, a lecture room and a reception hall that opens onto this terrace.

1. *Lobby*
2. *Laboratory*
3. *Lab prep*
4. *Computer lab*
5. *Seminar*
6. *Classroom*
7. *Auditorium*
8. *Reception hall*



FIRST FLOOR

Large windows, west-facing clerestories, and sloping ceilings provide classrooms with a generous amount of daylight (below).

University campuses in Brooklyn and Brookville.

Dr. David Steinberg, president of LIU, explains that it has not been a lack of appreciation for what Southampton could be that kept the campus from getting its share of attention and funding. Rather, over the last twenty years the university chose to spend more of the available money on its two other campuses, where competition for students was higher.

That imbalance is in the process of changing. Mitchell/Giurgola's master plan for Southampton, to be executed in phases, imposes a new system of roads around and between the existing buildings, which will give the site a sense of order. An elliptical drive will define a residential precinct and unify the dormitories, providing access to the front of the buildings. A gently curving north-south entry road will define the west end of the academic precinct, and parallel east-west roads will be used to form an academic quadrangle. A new student center and the renovated administration building will occupy what Broches describes as "the village green," an area between the residential precinct and the academic quad.

Existing parking lots will be broken up into smaller lots and divided by trees and plants to lessen their impact, and other landscape improvements that reflect the spirit of the master plan will be made throughout the various phases.



The plans make good use of Southampton's existing building stock. Some of the work involves moving the functions of certain buildings to other locations and then renovating or adding on to those buildings. The existing student center, for instance, will be converted into the library, and the library will become art studios. Related roadwork will be accomplished simultaneously with each building project. A new residence hall and an athletic center are also planned.

The first phase of the campus's makeover, the construction of the 38,000-square-foot Chancellors Hall and the northernmost of the campus's new system of roads, which defines the east-west side of the new campus quad, was completed this summer. The first floor of the building includes a 150-seat lecture room, a reception hall, several teaching laboratories, and a computer lab. On the second floor are offices for faculty members, the dean's suite, and broadcast facilities for the campus's National Public Radio station. "It is something like an entire campus in one building," says Broches.

The new facility is oriented to the north and south and connects at a right angle at its north end to an existing science building. The academic portion of the building—classrooms, labs, and offices—are arranged in a linear configuration that is generously daylit from the west by large windows and clerestories. A shed roof and generous overhangs to shade the windows, cedar soffits, and hand-molded red brick all help the building blend with neighboring structures.

At the south end of Chancellors Hall, the lecture room, reception hall, and radio station are grouped into a separate pavilion. Breaking up the massing of the building helps reduce the scale of what is by far the largest building on campus, but without diluting its presence as an anchor for the east end of the academic quadrangle. The pavilion, nestled in a stand of mature trees, is clad in solid copper shingles, hand-patinaed using a proprietary process after installation. The mint-green copper works beautifully with the lush surrounding vegetation.

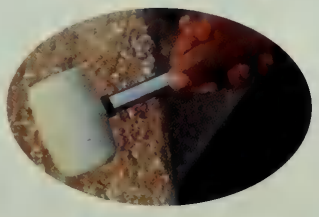
On the lawn, next to the academic wing of the building, a pair of short brick retaining walls were set into the ground to create a pair of grass-covered platforms that can be used for outdoor ceremonies, such as commencement exercises.

LIU's commitment to making the most of this campus is clear. When the project is completed—including site work and deferred maintenance—$35 to $40 million will have been spent. True, some large universities may spend this much on a single building. But for Southhampton College, the sum is considerable: last year's fall enrollment was only 1,900 students. ■

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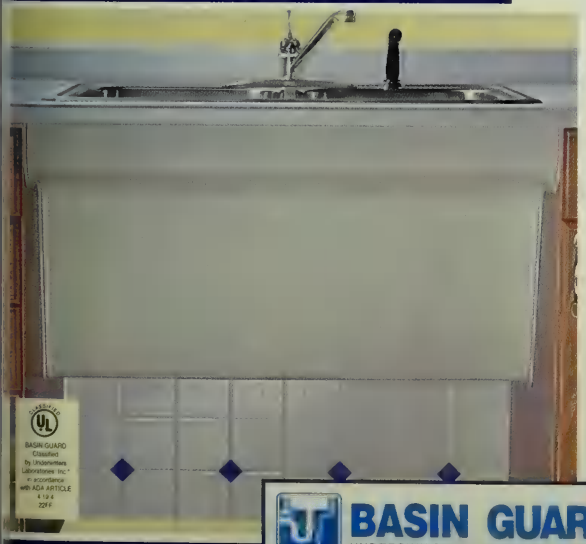
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Codes establish minimum safety and design guidelines for structures like the Mecklenburg County Jail Central in Charlotte, North Carolina, designed by Hellmuth, Obata + Kassabaum.

by Virginia Kent Dorris

A four-story atrium was to be the most striking feature of a new 150,000-square-foot bank building in suburban Chicago. The all-glass space would have introduced views and sunlight to interior offices and the elevator core and created an appealing entry. But the atrium could not be built, according to local code officials, unless the architects installed fire-rated glazing, doors, and walls at the entries to the elevator banks. The changes would have upped the cost of the building and negated the benefits of the glass atrium. So the architects instead divided the four-story space into two separate two-story atria. "Still nice, but nowhere near the same effect," says Avram Lothan, AIA, of DeStefano and Partners, who designed the building.

Architects are regularly asked to redesign, reengineer, or add expensive and often extreme health and safety features to a building in order to make it pass code. "Restrictions just get tighter and tighter, never more lax. They seem to pervade every aspect of the building. It's as if design freedom were slowly being choked off," Lothan says.

Bob Fowler, FAIA, acting director of planning and permitting in Pasadena, California, agrees. "The codes are written from the enforcer's standpoint in a fashion that is not friendly to architects," he says. "They are complicated documents that are intended to restrict what architects can do."

If codes are a frequent hindrance to design, communicating with code officials is, in some cases, an even bigger problem and something many design professionals would rather avoid altogether. Often it seems architects and code officials are operating at cross purposes. "Sometimes I get the feeling that the code officers are doing all they can to make sure a project doesn't get built," said one architect.

But the secret to operating successfully within the code structure is to embrace it, not condemn it or shun it. Architects who educate themselves about code provisions, think about code ramifications early in the design process, and keep up communications with code officials during a project report that their work survives the process with less conflict and fewer changes.

At their most basic level, building codes are a product of the collective experience of builders and designers, both their accomplishments and their mistakes, over hundreds of years. They are continuously created and revised in response to specific catastrophes: the first building code in the United States was published in Chicago in 1875, two years after the great fire. Building codes are created by professional model code organizations; their members are drawn from the construction and design community. They are written by consensus—members and various trade groups submit their proposals, which are voted on at yearly conferences. The resulting codes, once adopted by various localities, are enforced by law in order to prevent the construction of buildings that are dangerous.

There is a wealth of helpful information contained within the codes. It would be possible, for example, to build a safe stairway by simply following the tenets laid out by code. But the minimums of health, safety, and welfare established by the codes help architects go beyond meeting basic needs, enabling them to concentrate on more sophisticated design goals. "Codes and standards are a tremendous benefit to architects because they allow us to start at a much higher plane when designing

CODES PUBLISHED BY THE INTERNATIONAL CODE COUNCIL

1998: International Mechanical; International Energy Conservation; International Zoning; International Property Maintenance; International Fuel Gas; International One and Two Family Dwelling

2000: International Fire Prevention; International Residential; International Building; International Plumbing; International Private Sewage Disposal; International Mechanical; CABO One and Two Family Dwelling; CABO Model Energy; International Fire; International Zoning; International Property Maintenance; International Gas

Continuing Education *Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 208 and follow the instructions.*

Learning Objectives *After reading this article, you should be able to:*

1. *Explain why building codes originated and why they're still used.*
2. *Outline a process of code checks for a building project.*
3. *List the benefits of the new codes proposed for 2000.*
4. *Describe the difference between prescriptive and performance codes.*

Virginia Kent Dorris is a freelance writer specializing in architecture. She lives in Brooklyn, New York.

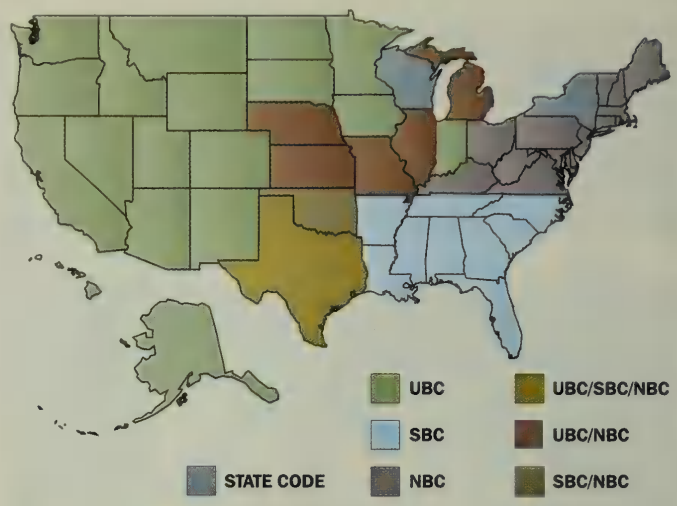
SINGLE INTERNATIONAL BUILDING CODE TO SIMPLIFY THE CODE PROCESS

The local codes that architects must comply with during the design and construction process are usually based on one of the three major model codes. Various localities often amend these codes to suit their particular conditions. The upshot is that architects must familiarize themselves with the special restrictions of each city, county, or state in which they work. To make matters more confusing, some cities, such as New York, Denver, Chicago, and Phoenix, have written their own building codes.

Now a single code, providing one set of rules to govern design and construction in the United States and the other countries that adopt it, is expected to be published in 2000. Known as the International Building Code, it is a distillation of the three major codes. It is being drafted by the International Code Council (ICC), a group comprising members of the three code organizations.

The development of a single national code has long been advocated by the AIA because of its obvious convenience for architects, says David C. Bullen, AIA, director of the AIA Center for Building Performance. Adoption of the single code will improve architectural education, which has traditionally focused little attention on codes. "Schools of architecture will be more receptive to teaching the fundamentals of health, safety, and welfare because of the common basis of the code," he says.

There are problems, however. Not every municipality will adopt the



CODE ORGANIZATION	CODE IN USE
INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO)	UNIFORM BUILDING CODE (UBC)
BUILDING OFFICIALS AND CODE ADMINISTRATORS INTERNATIONAL (BOCA)	NATIONAL BUILDING CODE (NBC)
SOUTHERN BUILDING CODE CONGRESS INTERNATIONAL (SBCCI)	STANDARD BUILDING CODE (SBC)

a building," explains James Kessler, AIA, senior project architect in the criminal justice focus group at Hellmuth, Obata + Kassabaum. For example, codes and standards for detention facilities provide an objective authority that determines what the design must include. Working within these givens, Kessler does not have to rethink security basics each time he works on a new facility. In this sense, codes also help limit the architect's liability.

Start with schematics

Probably the first step to ensuring the success of a project is to meet with code officials early—before designs are approved by the client. The relationship should be continued throughout the design process, especially if there is something unusual about the building. Tom Thompson, a building official in Broomfield, Colorado, is an advocate of early and frequent communication with architects. He makes himself personally available during planning board deliberations and encourages architects who call and ask about permits to make an appointment to meet him. "I can work off very sketchy plans, elevations, and a site plan, and probably resolve 60 percent of the problems right then," Thompson says.

While building officials can help solve various dilemmas, architects should, whenever possible, come prepared with their own set of alternative solutions, says Herbert Eisenberg, AIA, a code consultant with Sullivan Code Group in Boston. He knows of architects who have walked into building departments and thrown up their hands, asking the building officials to tell them what to do. Aside from showing "extremely bad form," these architects wind up sacrificing design approaches that may have worked better for their clients. Once officials are given responsibility for formulating a solution, they may not be willing to consider alternatives.

Mike Daley, an architect with the Neenan Company, a design-build firm in Fort Collins, Colorado, worked closely with Thompson during design and construction of a multibuilding complex in Broomfield for Hunter Douglas Inc., a window shade manufacturer. Daley went to Thompson's office with conceptual plans for the most recent building in the complex, a 130,000-square-foot warehouse and office structure. Daley knew from the start that the plan would not satisfy the existing local fire code, which limits buildings without a two-hour fire-wall partition to 50,000 square feet. A building of the size that Daley was planning would need to be split into three sections. However, the client wanted one huge, flexible space.

Working closely with Thompson, Daley designed the building around an "early suppression fast response" (ESFR) sprinkler system that could quickly dump huge volumes of water on a fire to protect large floor areas. Though the ESFR system was included in the latest version of the Uniform Fire Code, Broomfield was still working with an earlier edition of the code. In addition, to make the ESFR system work properly, Daley needed to eliminate the code-required curtain boards—noncombustible partitions suspended from the ceiling to keep smoke from spreading. After submitting engineering data and a video of the ESFR from Factory Mutual, an insurance company that produces fire protection standards, the Neenan Company's project was approved.

This kind of helpfulness on the part of the code official, and a willingness on the part of the architect to make that official part of the building team, goes a long way toward calming the sometimes stormy relationship between the two. It also helps if the code official is trained as an engineer, building contractor, or, especially, an architect. "Qualifications of code officials vary. If they come from a design or construction background, they will generally look at things more creatively," says Jon Traw, president of the International Conference of Building Officials. In general, more experienced officials are easier to work with—they're not so nervous about adapting the code to meet special considerations and they understand the repercussions of their decisions. "Some code officials are looking to police you, but the best ones make themselves part of the project development team," he adds.

new code. For example, Perry C. Tyree, a building official in Colorado who has been active in the code-writing effort for decades, warns that the three model codes were merged too quickly and that problems will result. The localities in his jurisdiction are likely to adopt the most recent version of the Uniform Building Code instead, even after the International Building Code is published, and will wait and see how the new code fares. "Other building officials may have time to work out the bugs, but I don't," Tyree says.

Though a major goal of the International Building Code is to simplify the regulation of building design and construction, it seems that nothing in the complex world of building codes is simple. In fact, while the ICC struggles to merge the three existing model codes to create one document, a subgroup of code writers has begun a second international code, known as the International Code Council Performance Code.

The difference between the two codes lies in their approach, explains Richard W. Bukowski, a senior research engineer at the Building and Fire Research Laboratory at the National Institute of Standards and Technology, a member of the Performance Code writing group. The new International Building Code is a conventional, prescriptive document that often details exactly how a building component or system must be designed. The Performance Code, on the other hand, explains the intent of the code in a specific situation and lets the designer figure out how to meet that objective. For the design of a wood-frame commercial building, for example, the International Building Code contains tables and charts detailing exactly what sizes of wood members are required. The Performance Code states the code's intent—that the structure should withstand specific wind, snow, and seismic loads, which depend on the building's performance requirements. The architect would size the members to satisfy that goal.

The Performance Code will also be published in 2000 and will likely be adopted locally as a companion to the International Building Code. Building plans could be evaluated under either code or both codes, as the situation requires. The authors of the Performance Code anticipate that it will be applied to only 5 to 10 percent of all new projects, and will have the most impact on unique buildings—those that do not fit easily into the prescriptive code structure. When designers use the Performance Code, it will be up to them to conduct tests and provide building officials with documents that prove that the design solution satisfies the intent of the code.

To further complicate the picture, a separate, new fire code has been developed, the International Fire Code. This will accompany the new International Building Code. The first draft was published in October 1997; the final version is expected in 2000. A second, performance-based version of the fire code has been written to complement the Performance Code. The National Fire Protection Association, which, until February, worked with the ICC on its International Fire Code, says it plans to continue to publish its own separate fire codes, NFPA 1, the Fire Prevention Code, and NFPA 101, the Life Safety Code.

The International Building Code and the International Fire Code are at the top of a list of consolidated codes already published by the ICC (see box, page 171). *V.K.D.*

Keeping up on codes

Seeing a project through the code process successfully also means being aware of current regulations and understanding how they will affect design. That's not so easy; code supplements make for tedious reading, and the portions actually adopted by different cities and states vary widely. Since most architects work in many different locations, brushing up on local codes could become a full-time endeavor.

Some local code enforcement agencies and building departments offer regular meetings and seminars for design professionals to help them keep up on code changes. William E. Cullen, AIA, of Mill Valley, California, attends monthly lunch meetings sponsored by the Marin County Code Advisory Board. "I can ask questions, get advice, and get to know the officials personally, which is very helpful," Cullen says.

Another option is to become a professional member of a code organization. That enables an architect to receive information on code changes as they are enacted and to gain access to the organization's technical staff. It also offers access to the code-creation process.

Hunter Douglas wanted an open warehouse, but fire codes forbade it. The architect worked with code officials to create an alternative means to satisfy code.





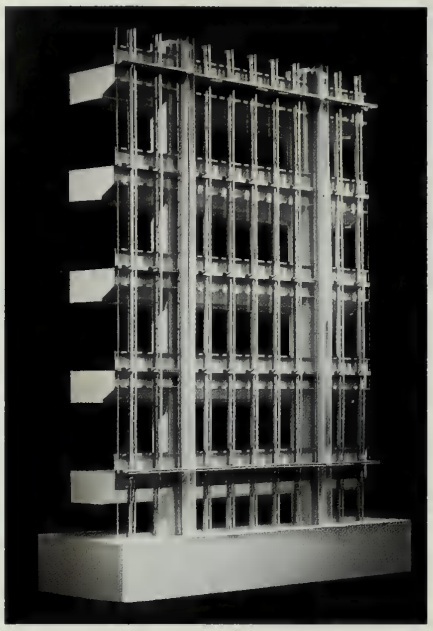
Calling on consultants

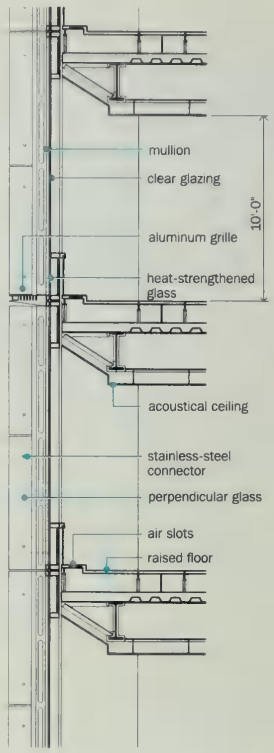
Architects commonly hire consultants, local architects, or engineering firms that specialize in code compliance to advise them—particularly for projects that attempt to satisfy code requirements by "alternate means." Such projects almost always require data from engineering tests and analysis to show that an alternative is equal to what is prescribed by code.

Engineering consultants provided essential expertise during code deliberations over the Federal Building and United States Courthouse in Phoenix, Arizona. The building, designed by Richard Meier & Partners, is organized around an enormous, glass-walled atrium that uses a type of evaporative cooling system. A fine mist of water is sprayed into the air near the top of the atrium. The cooled air drifts down through the 100-foot-high atrium and into the occupied space below, while hot air rises and is exhausted through ceiling louvers.

There are no mechanical exhaust fans at the top of the atrium to vent smoke in case of fire; the system is totally passive. This concerned code officials. "The code is very clear that when you have a large atrium, you are required to have mechanical smoke exhaust," says Gary Rose, a fire protection engineer with the General Services Administration. However, Rose allowed the project engineer, Ove Arup & Partners, to submit a report in support of the new system. That report, based on the results of a computer model, was too far out of Rose's experience for him to judge comfortably. So he turned to John H. Klote, a consultant in McLean,







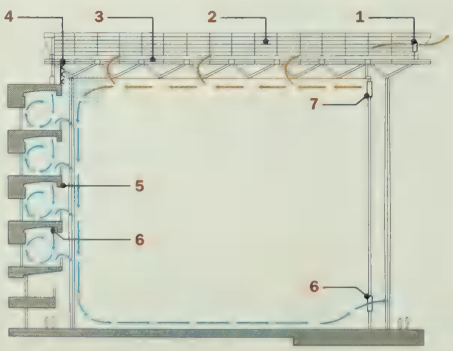
PARTIAL WALL SECTION

DeStefano and Partners' 35-story speculative office building uses new technology that challenges code. Air is distributed through pressurized under-floor plenums instead of conventional ductwork. Wiring, not encased in conduit, shares the plenum. Officials have approved the air system, but not the wiring.

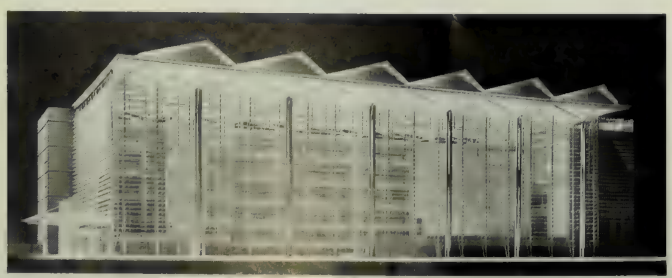
Virginia, and an expert in smoke dynamics and the physics of building fires. Based on the report, Klote concluded that the passive system would function in the event of fire. Rose then granted the building permit.

A fire safety engineer also consulted with Steven H. Ruiz, AIA, of Beery Rio & Associates, on finding ways to turn the Shenandoah, a 1906 National Historic Landmark apartment building in Richmond, Virginia, into an assisted-living facility for the elderly. The building's brick and wood construction did not conform to the National Building Code (NBC), used in Richmond. So the architects took advantage of a little-known state provision that permits use of an alternate building code in special instances. Instead of NBC, Beery Rio worked with the National Fire Protection Association's Life Safety Code, which was better suited to the rehabilitation project and allowed the architect to include sprinklers throughout the building, even in nonpublic spaces.

1. *Hot air vent*
2. *Hot air zone*
3. *Shading device*
4. *Water spray nozzles*
5. *Bulkhead*
6. *Air outlet*
7. *Air inlet*



Richard Meier's Federal Building and U.S. Courthouse uses a cooling system that challenged local codes.



Challenging conventional wisdom

Sometimes new technology challenges existing codes. As part of the design of a 35-story speculative tower in Chicago, DeStefano and Partners designed a 12-inch-deep, pressurized under-floor air plenum to deliver conditioned air through floor grilles instead of ductwork. Low-voltage, plenum-rated electrical wires, not encased in conduit, would also run within the space. The plenum system increases the flexibility of the building's open-plan office space; partitions and desks can be moved as needed without regard to ductwork and wires. "When there is a 'churn' of tenants there will be no need to call in an electrician," Avram Lothan says. "Just open up the floor and move the wires as needed."

Both the pressurized plenum and the wiring proposals conflict with Chicago's mechanical and electrical code. DeStefano and Partners filed an application with the building department asking for approval of the raised-floor pressurized plenum system on the grounds that it "meets or exceeds all performance characteristics for structural integrity and fire resistance of the specified materials and systems." The proposal was reviewed by the city last summer, and, while no variance was issued for the unsheathed wiring within the plenum, the air-distribution system was approved. Lothan calls the rejection of the wiring aspect "regressive." But the company's efforts have paved the way for other architects considering the under-floor plenum system, which is likely to be included in the next edition of the Chicago code. ■

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- 1996 International Mechanical Code
- 1997 Uniform Fire Code™**
- 1997 Urban-Wildland Interface Code™
- 1997 Uniform Building Security Code™
- 1997 Uniform Housing Code™
- 1997 Uniform Sign Code™
- 1997 Uniform Code for the Abatement of Dangerous Buildings™
- 1997 Uniform Administrative Code™
- 1997 Uniform Zoning Code™
- 1997 Uniform Code for Building Conservation™
- 1997 International Plumbing Code™
- 1997 International Private Sewage Disposal Code™
- Handbook to the UBC
- Handbook to the UMC
- Quick-Reference Guide to the UBC
- Dwelling Construction Under the UBC
- UFC Code Applications manual
- CABO/ANSI A117.1-1992

** Does not include NFPA Standards.*
*** Does not include Volume 2.*

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BREAK-THROUGH TECHNOLOGY HEIGHTENS THE PERFORMANCE OF WINDOWS AND DOORS

An Evaluation of Fiberglass Composite Profiles

With the introduction of its Integrity® brand of products, Marvin Windows and Doors is leading the window and door industry into the future. Supported by cutting-edge technology, the new product line provides the ultimate in performance. Step aside vinyl cladding and welcome fiberglass. Actually, Integrity® employs a fiberglass composite on the exterior of its windows and patio doors, yet retains wood on the interior for a traditional touch. The new composite, however, has brought an unsurpassed strength and resiliency to the industry.

Other products have employed a fiberglass composite made through the pultrusion process—fishing rods, golf shafts, transformer spacer sticks, and ladders. Introduced in 1994, Integrity® is one of the first window and door products to use, a fiberglass composite, Ultrex® on the exterior of its windows and doors. An examination of the process, product, and acceptance into the building materials industry provides a fascinating glimpse into the future. We have only just begun to examine new materials and their uses.

As part of the AIA/ARCHITECTURAL RECORD Continuing Education program, Marvin Windows and Doors offers the following examination of the Ultrex® fiberglass composite found on the Integrity® windows and doors from Marvin.

AIA/ARCHITECTURAL RECORD Continuing Education

Use the learning objectives below to focus your study as you read BREAK-THROUGH TECHNOLOGY HEIGHTENS PERFORMANCE OF WINDOWS AND DOORS. To earn two health, safety, and welfare learning credits, answer the questions on page 180 and follow the reporting instructions on page 210.

Learning Objectives:

After reading BREAK-THROUGH TECHNOLOGY HEIGHTENS PERFORMANCE OF WINDOWS AND DOORS, you should be able to:

1. Define composite window and door systems, with a particular emphasis on glass reinforced (continuous fiber) thermoset pultrusion, and describe the added value of fiberglass pultrusion technology.
2. Explain pultrusion technology—i.e., the manufacturing process of turning fiberglass filaments into window and door profiles.
3. Discuss the codification of new technology into building standards.
4. Identify how the Integrity line meets the new, voluntary ENERGY STAR® efficiency program.
5. Explain the conditions necessary to bring new technology to the building and design market.

BREAK-THROUGH TECHNOLOGY HEIGHTENS THE PERFORMANCE OF WINDOWS AND DOORS

An Evaluation of Fiberglass Composite Profiles

omposite Window nd Door Systems

In very simple terms, com-osite window and door pro-les contain fibers and resins ended together to form a ew material. The aim is to ncrease the window and oor systems' performance, oth durability and strength. he resin consists of a liquid, cross-linkable" plastic solu-on, which, when applied, cts as reinforcement for the bers. Currently, the fibers used are glass or ood. Three types of composite window nd door systems are available on the mar-et and made of the following: glass rein-orced (continuous fiber) thermoset pultru-on—Ultrex®; wood reinforced thermo-astic resin (extruded); and glass reinforced hopped fibers) thermoplastic resin.



For its Integrity® products, Marvin uses ltrex® as an exterior profile—the fiberglass-based compos-e manufactured by Tecton Products of Fargo, N.D. Marvin considers the use of Ultrex® "a breakthrough in exterior protection." Integrity® features windows and patio doors clad with Ultrex® on the exterior and ponderosa pine on the interior. The wood surface brings the traditional warm presence of wood into the interior.



Pultrusion Technology

Each of the above mentioned technologies employs a very different, highly specialized process to manufacture composite window and door profiles. Pultrusion, which is the focus of this report and the process used to make Ultrex®, consists of pulling filaments and fiberglass matting. The filaments are then soaked with liquid polyester resin to add biaxial strength, shaped, heated and dyed, and cut to precise dimensions by diamond-impregnated blades (see chart below). A white or pebble gray factory

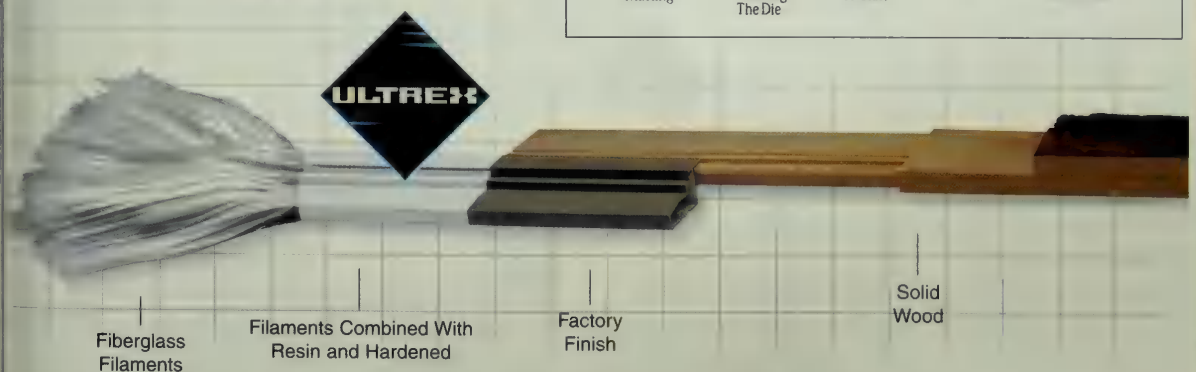


TECTON Production Process

Fiberglass Thermoset Pultrusion



◆Filament Dispensing	◆Forming Process	◆Resin Saturation	◆Curing Process	◆Cutting
Fiberglass Rovings & Matting	Shapes Material Entering The Die	Resin Added To Glass	Heated Die	Diamond Impregnated Saw Blades



LEXICON

As referenced in ASTM D 4385 Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Profiles

Blister—
A rounded elevation of the pultruded surface with boundaries that may be more or less sharply defined.

Breakout—
Individual fiberglass strands that are loose or frayed, typically near fabricated edges.

Chips—
Minor damage to the pultruded or coated surface that removes material, but does not cause a crack or a craze.

Coating—
UV protective material usually applied to areas exposed to direct sunlight after installation. Interchangeable with the term "film."

LEXICON (con't)

Colored marking **— Discoloration on the surface of the pultruded product that cannot be removed by rigorous cleaning.**

Delamination **— The separation of two or more layers or piles of reinforcing material within pultrusion.**

Die-parting Line **— A lengthwise flash or depression on the surface on a pultruded part.**

Groove **— Long narrow grooves or depressions in a surface of a pultrusion parallel to its length.**

Hair-line craze **— Multiple fine pultrusion surface separation cracks that exceed 1/4 inch in length and do not penetrate in depth to the equivalent of a full ply of reinforcement.**

finish of acrylic urethane coating is sprayed on and then baked, a coating that can be custom painted.



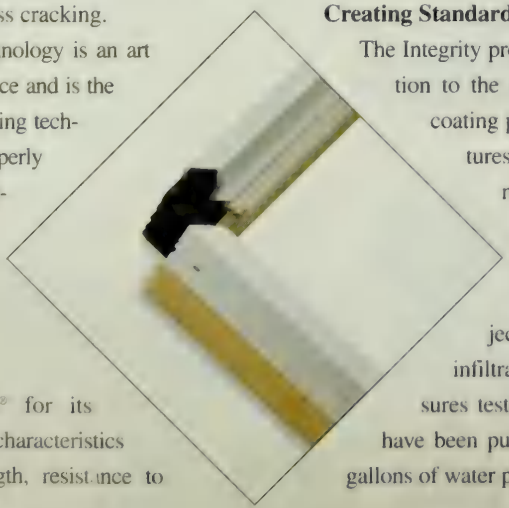
For this manufacturing process, the laminating resin may be an unsaturated polyester resin, a vinyl ester resin, or an epoxy resin, but approximately 90 percent of all pultruded products—and Ultrex®—use polyester resins. In addition, Ultrex® has an acrylic urethane factory finish coating system because of its excellent gloss and color retention, hardness, and abrasion and chemical resistance and UV protection.

Excellence in pultrusion technology depends upon three key factors, according to expert Raymond W. Meyer in his *Handbook of Pultrusion Technology*.

Formulation of the resin. "The type of resin used affects the mechanical characteristics, operating temperature range, electrical insulation, and corrosion resistance as well as the flame and smoke properties. The resin also governs process speed by its reactivity and can significantly control product aesthetics and tolerance capability. It is essential to the success of any pultruded profile that the polymer matrix be properly engineered to meet the desired end use properties while taking into account aspects of the application," Meyer says.

Product temperature. In thermoset resin systems, such as the process used to make Ultrex®, it is important to control the rate and level to which heat is added, as well as removed. Too little heat can result in incomplete cure and less than designed properties in the finished profile. Too much heat can induce thermal stress cracking.

Forming technology. "Forming technology is an art that develops over years of experience and is the single most guarded area of processing technology," Meyer contends. If improperly executed, problems will include chipping, cracking, poor reinforcement distribution, and frequent breakouts.



Value-Added

Marvin's adoption of Ultrex® for its Integrity® products hinged on the characteristics Ultrex® can provide added strength, resistance to warping and corrosion, and its high insulating values and low maintenance needs.

Strength. Ultrex® has a tensile strength (pull strength in the same direction of fibers) that is stronger than steel. According to Meyer, "with FRP materials there is no yield point in the stress-strain curve as there is with steel. The strain is directly proportional to the applied load up to the point of catastrophic failure." Ultrex®, therefore, ultimately adds significant strength and stability to the entire window system.

Resistance to warping. Ultrex® is virtually unaffected by heat and cold, which prevents warping. In fact, examined under the same conditions, Ultrex® moves only 1/10th as much as vinyl in reaction to heat and cold. Or think of it this way: with Ultrex®, the basic exterior cladding element is glass. And since both the cladding and the glass will expand and contract at a similar rate, the integrity of the glazing seal will remain. This minimal expansion/contraction difference reduces warping, keeping corners square and keeps window operation smooth and precise.

Resistance to corrosion and moisture. Used in chemical plants, offshore oil platforms, and underground gas tanks, Ultrex® has proved to be chemically resistant. The coating provides a high barrier to sun, rain, and airborne pollutants. In addition, the factory finish protects against UV radiation and allows the material to maintain its color and gloss. If desired, latex paint can be applied to the exterior.

Creating Standards for New Technology

The Integrity product line was developed with attention to the mechanical material properties and coating performance as well as aesthetic features. As a new window and door component, Ultrex® was tested in compliance with other window performance standards. In fact, the Integrity products have been subjected to extensive air infiltration, water infiltration, physical load, and design pressures tests. For example, Integrity® windows have been pummeled with the equivalent of five gallons of water per hours, per square foot (equaling

nches of rain per hour); tested under air pressure of 4.5 pounds per square foot (42 MPH); and subjected to positive and negative testing where 45 pounds of air pressure per square foot (126.5 mph).

Integrity products have passed the applicable test procedures for forced entry resistance, water resistance, and structural performance referenced by, among others:

- American Architectural Manufacturers Association
- American National Standards Institute
- Canadian Window and Door Manufacturers Association
- Insulating Glass Certification Council
- Screens Manufacturers Association, and
- National Wood Window and Door Association.

At the same time, it was necessary for the industry to create new standards for fiberglass reinforced thermoset profiles that could be referenced by the AAMA as voluntary specifications. For this, Tecton Products and Marvin Windows and Doors worked closely with AAMA, drawing from other standards for the fiberglass composite as used in other products. A tremendous undertaking, the process is still ongoing, with further refinements expected.

As it currently reads, the purpose of the specification known as AAMA 305-98), is to "assist the architect, contractor, manufacturer, designer, and owner in specifying fiberglass reinforced thermoset profiles for use in windows, doors, and skylights that provide and maintain a standard and superior level of coating performance over a period of many years."

AAMA 305-98 sets forth the following:

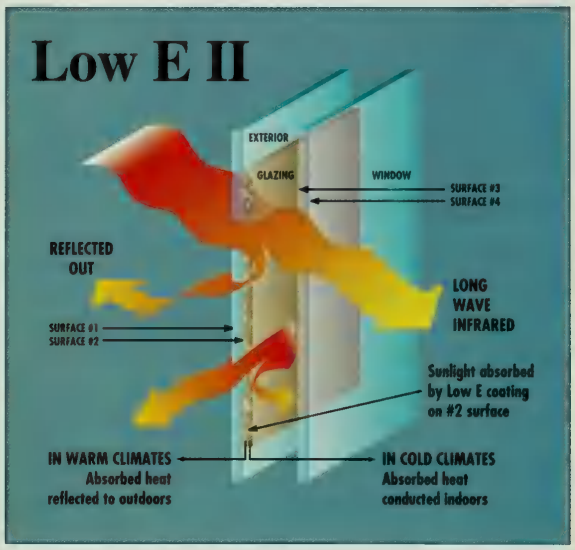
- Performance requirements for fiberglass reinforced thermoset profiles for use in windows, doors, and skylights.
- Test procedures and requirements for standard and high performance coatings applied to fiberglass reinforced thermoset substrates, covering factory-applied coatings applied by spray or other appropriate application methods.
- Addresses requirements covering design criteria, finish and appearance, coating performance, and physical properties.

To qualify as meeting this specification, products tested shall meet all requirements as specified.

Energy Performance

To competitively bring Ultrex® clad windows and patio doors into today's marketplace, Marvin turned to a highly energy efficient glazing system—Low E II with argon. For its standard Integrity products, multiple energy-reflective coatings are combined with argon gas and a warm edge spacer. In warm climates, absorbed heat is reflected to the outdoors and in cooler climates, heat is not conducted outdoors. The result is that homeowners should generally use 25 percent to 44 percent fewer BTUs for heating and cooling when using Low E II instead of clear insulating glass.

Featuring Low E II argon glazing, all Integrity products exceed new voluntary criteria for energy performance set forward by in the ENERGY STAR® windows program by the U.S. Department of Energy and the fenestration industry. All ENERGY STAR® qualified windows receive an NFRC rating, certification and label for both U-factor and solar gain.



Ease of Installation

Still, Marvin determined that to be competitive the Integrity windows needed to be "builder friendly." Therefore, ease of installation was an important component, as was the availability of a variety of window styles and sizes. For easy installation, the units come standard with jamb extension and the nailing fins applied, thus reducing the time it takes a contractor or installer to prep the window before actual installation. The window frames are manufactured square and are stable, easing the squaring and plumbing of units. In addition, factory mulling is offered for the majority of the configurations. A variety of window sizes and styles are offered: double hung, gliders, casement and awning, round top, transom and picture; multiple assembles, bay windows, bow windows and patio doors.

LEXICON (con't)

Inclusion—
Any foreign matter or particles that are either encapsulated or imbedded in the pultrusion.

Porosity—
The presence of numerous visible pits or pinholes at or near the pultruded surface.

Fiberglass reinforced thermoset—
Material in which glass fibers are blended with resin materials and cured into thermoset composites.

Sloughing—
A condition wherein scales peel off or become loose, either partially, or entirely, from the pultrusion.

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

Instructions

- Refer to the learning objectives on page 1.
- Complete the questions below. Then turn the page upside down and check your answers.
- Fill out the self-report form (page 210) and submit it or use the Continuing Education self-report form on *Record's* website, www.architecturalrecord.com to receive two health, safety, and welfare AIA Continuing Education units.

Questions:

1. Define composite windows and door systems in general terms, and, more particularly, the type of composite system under discussion.

2. Explain pultrusion technology and what this manufacturing process adds to a window and door profile.

3. Describe the various window performance tests the Integrity® windows and its Ultrex® composite are subjected to, as well as the larger effort to codify the composite known as fiberglass reinforced thermoset profiles.

4. Describe how the Integrity® product line meets the new ENERGY STAR® windows program criteria, as well as what that program is.

5. What conditions are necessary to bring new technology to the building and design market?

Answers:

1. Composite systems contain fibers and resins blended together to form a new material. For the Integrity® brand of products, Marvin uses Ultrex®, which is a glass reinforced continuous fiber) thermoset pultruded composite.

2. The pultrusion manufacturing process consists of pulling glass filaments and fiberglass matting through a liquid polyester resin bath, shaping, heating, dying and cutting to precise dimensions. The goal is increased performance, both strength and durability.

3. As a new window and door component, Ultrex® was tested in compliance with other window performance standards. In fact, the Integrity® products have been subjected to extensive air infiltration, water infiltration, physical load, and design pressures tests. In addition, specifications for fiberglass reinforced thermoset profiles were developed for the American Architectural Manufacturers Association, an ongoing process involving manufacturers and code officials.

4. Low E II glazing brings the Integrity® product line into compliance with the new ENERGY STAR® windows program requirements. The Low E II system consists of multiple energy-reflective coatings combined with argon gas and a warm edge spacer. In warm climates, absorbed heat is reflected to the outdoors and in cooler climates, absorbed heat is conducted indoors. The ENERGY STAR® windows program is a cooperative effort by the U.S. Department of Energy and the fenestration industry to encourage compliance with new voluntary energy usage standards. All ENERGY STAR® qualified windows receive an NFRC rating, certification and label for both U-factor and solar gain.

5. Besides a need to gain recognition from the building standards organizations, a new product like Ultrex® and Integrity® brand of products, must be guaranteed some market acceptability. For building products, ease of installation is important, as well as competitive life-cycle costs.

MARVIN Windows and Doors

Certified Forest Products: Solutions for Sustainable Design

CERTIFIED FOREST PRODUCTS OFFER A POSITIVE, PRACTICAL ANSWER TO THE QUESTION, "CAN I STILL BE 'GREEN' AND SPECIFY WOOD?"

Sustainable Design Needs Well-Managed Forests

by Wm. McDonough, FAIA

Sustainability is a design framework that requires us to reach beyond ourselves nd to touch lives that are conti- ents and generations apart. ustainability requires that we hink not just of the present, but f the future — in our day-to- ay decisions, in the expression f our intentions through design, nd in our approach to the esign of buildings, neighbor- oods, and regions.

ustainability does not focus on a ecision made or an action taken t a fixed point in time. Sustain- bility is dynamic — it demands ontinuous innovation and adap- ation to survive in a world that s evolving environmentally, ocially, and economically.

ustainability is forever. Just as orests are forever. Or should be.

he decisions we make regarding ustainability (and sustainable orests in particular) must with- tand the test of generations, not ust of years. What legacy are we eaving our children? Our chil- ren's children's children?

Vithout immediate change in the vay we use our forests, our lega- y will be the destruction of plant nd animal species, the squan- ering of their unique genetic information, and the loss of their subtly intricate, irreplaceable beauty. We will compromise our air and water resources and instigate devastating climatic change. Continuing our present forest management practices will further devalue the forests as a productive resource, which in turn will devastate the lives of even more people dwelling in forest-dependent communities.

We have attempted to bring about change in the way we manage our forests from the outside — through extensive governmental regulation and incessant litigation by organizations of every ilk. It isn't working. When government intercedes in business through regulation, business slows down. Litigation, and the potential for litigation, forces businesses and government alike to focus on temporal issues instead of on building legacy. The adversarial environment we have created around the management of our forests is unbelievably wasteful of time, money, and human energies that could be better spent building a better future. And by focusing on today's activities rather than on legacy, the environment created by regulation and litigation is wasting the future of our forests. Why not build a sustainable legacy for our forests by actively encouraging and rewarding better management practices by forest operators? Doing so would present excellent opportunities for profit, would neutralize the adversarial business climate, and would have the potential to eliminate the need for mountains of regulation, saving businesses and taxpayers a substantial amount of money.

Can we do it? *By all means!* As members of the design community, we have the power to build legacy in every specification we write regarding wood products. By designing-in products originating in well-managed forests (that is, forests certified as well-managed in compliance with the principles and criteria of the Forest Stewardship Council), we offer the forest products value chain the opportunity to profit from improved management practices. In our choice of products and construction techniques, we promote appropriate utilization of the forest resource. In our selection of species and grades, we support the balanced use of the entire forest ecosystem, and eschew the practice of highgrading which devalues forest ecosystems and, ultimately, destroys forest dependent communities.

The legacy we pass along to our children, and to future generations, will include a chapter written by our decisions regarding our forests. Only by encouraging and rewarding better forest management practices will that chapter be one that sustains us better environmentally, socially, and economically.

Learning Objectives:

Use the following objectives to focus your study. After reading Certified Forest Products: Solutions for Sustainable Design, complete the questions at the end of this section and check your answers.

AIA members can fill-out and return the self-report form in this issue or e-mail the self-report form to earn two AIA Learning Units that qualify for health, safety, and welfare credits.

After reading Certified Forest Products: Solutions for Sustainable Design, you will be able to:

- *Contrast the static model of sustainability with the dynamic model.*
- *Describe how a forest can become certified.*
- *Explain the chain of custody for certified forest products.*
- *Write specifications for using certified forest products.*

William McDonough, FAIA, is Dean of the School of Architecture and founder of the Institute for Sustainable Design at the University of Virginia. He is a principal of William McDonough + Partners, Architects and Planners. In 1996, he became the first individual to win the Presidential Award for Sustainable Development.

Forest Certification: A Tool For Sustainable Development

DETERIORATION OF FOREST ECOSYSTEMS THREATENS OUR SUSTAINABLE FUTURE. INDEPENDENTLY CERTIFIED "WELL-MANAGED" FORESTS HOLD ENVIRONMENTAL, SOCIAL, AND ECONOMIC PROMISE

Our Forests: A World-Wide Concern

As the popular press has made us all too aware, the world's forests continue in decline. This loss of forest ecosystems holds serious consequences – not only for biological diversity, wildlife habitat, soil and water quality, and climatic stability, but for the human communities that depend on forests for their survival.

Of equal concern is the fact that the deterioration of forests is not a problem confined solely to one geographic region or a single forest type – the world's tropical rainforests, for example. Increasing pressure on temperate and boreal forests is pushing these ecosystems to their biological limits as well.

Overharvesting in the southeastern United States, deteriorating forest health in the western U.S., and large-scale clearcutting in the boreal forests of Canada are negatively impacting the inherent value of our forests. This results in the loss of wildlife habitat and the deterioration of both soil and water quality. Forests with reduced diversity are more vulnerable to insects, disease, and catastrophic fires. Even in the temperate hardwood forests of the eastern United States, where selective harvesting tends to be more common than clearcutting, highgrading has removed the best trees and has depleted genetic resources. These transformations continue to compromise our diverse forest ecosystems and their capacity to produce high-quality forest products on a sustainable basis. And as the productive value of the forest wanes, the economies of forest-dependent communities collapse, forcing the population to either abandon the forest community altogether or to convert forestland to another use, such as grazing or farmland.

A Viable Solution

Concerned about the future of our forests and the people who live and work therein, environmental interests have joined together with industry and commerce to promote independent, third-party forest certification, a non-regulatory solution to restore the health of our forests, ensure their productivity for future generations, and guarantee a stable supply of natural wood and paper products.

Independent, third party forest certification is a voluntary process that employs international principles to evaluate forest resource management. Independent certification organizations conduct initial and regular follow-up inspections to monitor long-term sustainability of the resource, ecosystem stewardship, and socioeconomic responsibility.

The certification of forests is a relatively new development, one that is growing steadily on five continents. As of this writing, some 25 million acres of forest worldwide have been certified as well-managed, including 3.5 million acres of certified forests in the United States.





In South America, a professional forester instructs indigenous forest workers in best management practices (left) , including reseeding and reforestation (right). Photos courtesy Plaza Hardwood

A Wide Range of Options

The range of certified forest products available to architects, specifiers, and other purchasers continues to expand on a near-daily basis. Lumber, timbers, trusses, and flooring are available from a growing number of sources, as are hardwood and softwood plywood and veneer products. Finished goods ranging from casework and mouldings to furniture and sports flooring also are available as certified forest products. Certified forest products offerings represent an exhaustive range of species that includes commonly specified hardwoods and softwoods and a broad palette of lesser-known species from temperate and tropical forests – all in a wide variety of grades.

"Increased demand-side pressure for certified forest products is what will drive improved forest management practices here in North America, "says David Ford, president of the non-profit Certified Forest Products Council. "As certified wood is preferenced by more companies, government agencies, and the design community, forest producers will bring more acreage under certification and will develop more certified products in order to retain or gain additional market share." Market advantage, Ford says, will go to those visionary companies who embrace certified forest products as part of a strategy of sustainability.

The push for certified forest products has already begun. The cities of Long Beach, CA and Philadelphia, PA have employed certified wood in the construc-

Advertising supplement provided by the Certified Forest Products Council and The Pew Charitable Trusts

Tool for Sustainable Development – continued

on of a pier boardwalk and ridge esplanade, respectively. ne American Museum of Natural istory incorporated certified oods throughout the structure nd exhibits of its Hall of Bio- iversity. Commercial developers, uch as New York-based Turner onstruction, have committed to reference certified forest prod- cts. Similar public purchasing olicy is in place or under devel- pment at the city level across ne country.

ne specification of independent ird-party certified forest prod- cts offers the design community vital and dynamic tool for nsuring sustainable develop- ent. Reliance on certified forest roducts helps ensure that our orests will be managed in a anner that is environmentally sponsible, socially beneficial, nd economically reliable for enerations to come.



his certified forest in Maine provides ch, diverse habitat.
hoto courtesy Seven Islands Land ompany

Understanding Forest Certification

Q&A ABOUT THE PROCESS THAT IS REDEFINING FOREST MANAGEMENT

by Eric Hansen, Oregon State University

What is Forest Certification?

Forest certification is a system for identifying forestland that is well managed with a goal toward sustainability. In this context, sustainability includes ecological, economic and social components. Products from certified forestland are identified by a special ecolabel.

Forest certification was conceived of as a way to promote sustainable forest production. It allows landowners to let customers know how they manage their forests. Forest certification also may function as a market-based mechanism to reward superior forest management.

Although there are other types of forest certification, this article deals only with independent third-party certification. Independent third-party certification is an on-the-ground evaluation of forest management conducted by an accredited certifying organization, based on accepted standards. It is similar in nature to a financial audit of a corporation.

Who oversees the certification process?

The Forest Stewardship Council (FSC), an international, nongovernmental organization, accredits third-party certifiers and facilitates development of forest management standards. The FSC was founded in 1993 "to promote environmentally responsible, socially beneficial, and economically viable management of the world's forests." Operating in 25 countries on five continents, the FSC currently runs the only internationally active, third-party certification system.

How are forest management standards developed?

The FSC has developed a set of 10 Principles and Criteria covering topics such as management planning, maintenance of natural forests, and environmental impact. FSC-designated agencies organize stakeholder groups to create regional standards following these principles and criteria. It is up to the FSC to approve standards and assure consistency among standards.

Who are the certifiers?

In the United States there are two accredited certifiers. Scientific Certification Systems, located in Oakland, California, has a background in environmental certification. SmartWood, the world's first forest certifier, is headquartered in Vermont and has regional affiliates that perform certifications.

What happens in a certification?

A landowner or land manager contracts with an accredited body to conduct the certification. The fee for the certification covers the audit process, and is not contingent on a positive outcome of the certification audit.

An interdisciplinary team of forestry experts conducts an on-the-ground evaluation of the forest, assesses the forest management plan, and interviews people familiar with the operation. This certification audit evaluates the long term ecological, social, and economic benefit of the forestry operations according to FSC principles and criteria.

Silvicultural practices are evaluated in light of FSC-endorsed regional standards, site conditions, and the management plan. If the audit team finds that the forest is being well-managed, a certificate is issued, and the forest operator is entitled to use the FSC ecolabel to identify products coming from that forest. Certified operations must be audited each year to maintain their certification.

FSC

What is chain-of-custody?

To carry the FSC ecolabel, a product must be documented as coming from a certified forest. The paper trail is called the "chain-of-custody." Every manufacturer and distributor of the certified product must be chain-of-custody certified in order for the product to bear the FSC ecolabel when sold. To attain a chain-of-custody certification, a manufacturer must demonstrate that certified materials are kept separate from noncertified materials, and that they can be accurately tracked throughout the manufacturing process.

What are percentage-based claims?

A percentage-based claim allows a product to carry the FSC ecolabel even if it is not made entirely from certified wood fiber. Current rules permit wood products containing at least 70 percent certified fiber to carry the FSC ecolabel.

FSC Principles And Criteria For Forest Management:

The tenets that lay the foundation for independent third-party forest certification worldwide

PRINCIPLE #1:
COMPLIANCE WITH LAWS AND FSC PRINCIPLES
Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

PRINCIPLE #2:
TENURE AND USE RIGHTS AND RESPONSIBILITIES
Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

PRINCIPLE #3:
INDIGENOUS PEOPLES' RIGHTS
The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognized and respected.

PRINCIPLE #4:
COMMUNITY RELATIONS AND WORKER'S RIGHTS
Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.

PRINCIPLE #5:
BENEFITS FROM THE FOREST
Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

PRINCIPLE #6:
ENVIRONMENTAL IMPACT
Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

PRINCIPLE #7:
MANAGEMENT PLAN
A management plan — appropriate to the scale and intensity of the operations — shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated.

PRINCIPLE #8:
MONITORING AND ASSESSMENT
Monitoring shall be conducted — appropriate to the scale and intensity of forest management — to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

PRINCIPLE #9:
MAINTENANCE OF NATURAL FORESTS
Primary forests, well-developed secondary forests and sites of major environmental, social or cultural significance shall be conserved. Such areas shall not be replaced by tree plantations or other land uses.

PRINCIPLE #10:
PLANTATIONS
Plantations shall be planned and managed in accordance with Principles and Criteria 1-9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

Revised version, 1996, provided by Forest Stewardship Council — U.S. Initiative. For additional information, visit the FSC-US web site at www.fscus.org.

The Certified Forest Products Council: A Valuable Resource for Sustainable Design

A voluntary, not-for-profit business initiative, the Certified Forest Products Council is committed to helping make your firm a leader in the specification and use of environmentally responsible forest products. The Council offers a variety of services to the design community:

Assistance in Guideline and Specification Development
We can provide samples of the following documents, and can help tailor them to your needs:

- policy statements outlining your commitment to the environment and to the specification and purchase of certified forest products;
- draft bid specification and purchasing guidelines;
- letters of intent and inquiry for suppliers.

Assistance with Education and Training
We can help you:

- plan on-site seminars for design team and staff, addressing the specific interests and needs of your organization;
- develop proprietary materials to educate your clients and suppliers about certification, the chain of custody, and the feature/benefit matrix for certified forest products;
- provide a variety of educational materials, brochures, white papers, and reprints related to the forest certification.

Assistance in Tapping into Sources of Certified Supply
Our certified forest products resource directory is an essential tool for the sustainable designer. It is available free to Council members and at a nominal cost to non-members.

For additional information, contact CFPC, 14780 SW Osprey Dr. Ste. 285, Beaverton, OR; 503/590-6600; visit us on-line at www.certifiedwood.org or send specific questions to: info@certifiedwood.org

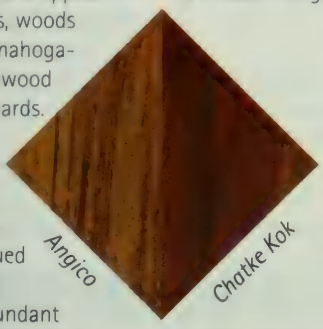
Sustaining the Forest Resource Through Use of Lesser-Known Species

SPECIFYING ALTERNATIVE, UNDER-UTILIZED SPECIES EXPANDS DESIGN OPTIONS AND EXTENDS THE FOREST RESOURCE

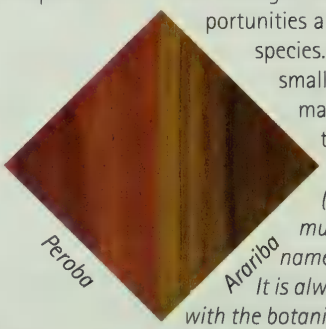
ver the centuries, the design ommunity and the consuming ublic have developed a penchant or using a relative handful of ood species. Due to their avail- ility, workability, and appear- nce characteristics, woods uch as oak, teak, mahoga- y, maple, and rosewood ave become standards.

ut the state of ie world's forests allenges the wis- om of our continued ependence on the lassics." Once-abundant ecies, including mahogany nd rosewood, are in dramatic ecline, and dozens of other ecies are listed as threatened or ndangered by the Convention on ternational Trade in Endangered ecies of Wild Fauna and Flora ITES). To make matters worse, ie inefficient practices used to ing these preferred woods to arket have laid waste to mil- ons of acres of forested land.

is clear that if we are to leave a gacy of sustainable productive rests, we must make better and ore balanced use of the forest source. Two opportunities exist. rst, by utilizing lesser-known ecies in lieu of the handful of tandards" we now depend so eavily upon, we can alleviate essure on species that are reatened with extinction from verharvesting. We also can dra- atically improve the economics sustainable forest manage- ent by demonstrating the value of the full panoply of forest resources. This, in turn, will provide an incentive to maintain the wide diversity of species in natural forests. Second, we can utilize a broader range of lumber grades within a given species. Current practices utilize only clear or near-clear wood for value-added products. Yet these grades account for only a very small percentage of the available wood fiber in the forest. Specifying a wider range of grades not only extends the forest resource, it enables us to take fuller advantage of the unique beauty that each tree exhibits though color variations and knot patterns.







Indeed, lesser-known species have begun to gain a toehold as viable alternatives to typically specified woods. Several recently completed projects – both custom homes and commercial buildings such as the Niebaum-Coppola Winery in Northern California and the American Museum of Natural History in New York City – incorporate virtually unknown woods in furniture, flooring, and interior woodwork.

Harvested from forests that have been certified as "well managed" according to standards endorsed by the Forest Stewardship Council, these lesser-known species exhibit equivalent or superior performance and aesthetic characteristics to the species they replaced.

Expanded design opportunities

The palette of available lesser-known species is broad and constantly growing as the design community embraces these more ecologically responsible alternative woods. Alternative woods can be found in all forest types, with the greatest design opportunities among tropical species. Following is a small sampling of the many certified tropical species available. *(Note: There may be multiple common names for each species. It is always best to specify with the botanical names.)*



Lesser-known-species Chechen and Granadillo, both from FSC-endorsed certified forests, are used extensively throughout the tasting room at Niebaum-Coppola Winery. Photo by Gerold French, courtesy of Talbert Communications.

Angico
Anadenanthera colubrina
Angico heartwood is pale brown, but darkens to a reddish brown with darker colored, almost black, streaks, contrasting nicely with the yellow brown or light pink sapwood. The grain is irregular and interlocked, while its texture is fine and uniform. Excellent for outdoor applications due to its density, durability and rot resistance. It is preferred for flooring and turnery.

Arariba
Centrolobium microchaete
Also known as Canarywood, Arariba is yellow to orange with streaks of red, purple and black. This medium-textured wood is excellent for furniture, cabinetry, flooring, and interior applications.

Cancharana
Cabralea canjerana
Cancharana is easy to work and

finishes smoothly. Its heartwood varies from red to maroon, while its sapwood is pink. Somewhat brittle, its medium-course grain texture can be either straight or wavy. Cancharana is suitable for interior and exterior construction, joinery, and fine furniture.

Chakte Kok
Sickingia salvadorencis
This wood is a vibrant, almost shocking pinkish red with occasional brown streaking. Medium hard and dense with a fine, even grain, its color tends to fade to brown with exposure to sunlight. An UV-light-inhibiting finish will slow this change.

Chechen
Metopium brownei
This wood is quite hard, dense, and tight-grained. Chechen's color ranges from amber to dark brown, often with a range of colors and contrasting streaks. Very rot-resistant, Chechen is excellent for furniture-making and a variety of other applications.

Curupau (Bolivian Rosewood)
Anadenanthera colubrina
Curupau heartwood is chestnut brown with light streaks when first cut, and darkens to reddish brown with dark streaks after exposure to sunlight. Curupau sapwood is yellowish brown to light pink, and its interlocking grain is fine and uniform. Strong and highly resistant to decay, fungi and insects, Curupau is used in heavy construction, marine applications, flooring, outdoor furniture, and turnings.

Granadillo
Platymiscum yucatanum
Granadillo runs the color spectrum from violet to dark red to brown with frequent streaking and pronounced figure. Its occasionally light-blonde sapwood contrasts beautifully with the heartwood. Very hard, heavy, and dense with a tight grain and a fine texture, Granadillo is often used in furniture and instrument making. It is an excellent substitute for Rosewood or Cocobolo.

Katalox
Swartzia cubensis
Violet when first sawn, Katalox's heartwood oxidizes quickly to a deep purple-brown that contrasts dramatically with its creamy sapwood. Dense and somewhat brittle, katalox is a suitable substitute for Ebony.

Peroba
Aspidosperma polyneuron
Peroba ranges in color from rose-red to yellowish, with little or no distinction between the heart and sapwood. The fine textured grain varies from straight to irregular. This handsome wood works moderately well, and finishes readily. Favored for fine furniture, cabinet work and decorative veneers, Peroba is also suitable for use in flooring, interior trim, sashes, doors, and turnery.

T'zalam
Lysiloma bahamenis
The heartwood is lustrous brown with a coppery or purplish tinge, sometimes faintly striped, and is sharply demarcated from the thin white sapwood. Moderately hard and dense with a medium texture, T'zalam is easy to work, finishes smoothly, and takes a high natural polish. It is ideal for fine furniture and interior finish work.

Architects should reference the CITES listing of endangered species prior to specifying any tropical wood. For additional information about lesser known species, grades, or CITES, email: info@certifiedwood.org

Specifying Certified Forest Products

WRITING THE SPEC IS EASY WHEN YOU KNOW THE LANGUAGE HERE'S HOW TO HOLD THE SPEC IN A WORLD THAT DOESN'T

The Certified Forest Products Council (CFPC) has developed specification guidelines in an effort to encourage an industry standard that provides credibility to claims of environmental stewardship and ensures fairness and efficacy in the marketplace. As with specifications for any unique material, the language calling for the incorporation of independent, third-party certified forest products must be concise, clear, and unequivocal.

CFPC's strategy on this matter is straightforward: to employ a definition for certified wood referencing Forest Stewardship Council guidelines to assure efficacy; and to provide sourcing information to bidders to promote efficiency.

Ideally, the availability of desired certified wood products and species should be explored during Design Development. At this time, the prospects for alternative species and grades can be integrated within the design decision and material selection process.

The following Sample Specification Language can be incorporated into project documents in a variety of ways, depending on the size and complexity of a given project:
1) If a given specification initiative is to use the Construction Specifications Institute (CSI) format, the issue of sustainable forest management can be addressed on multiple fronts. Within each section, Parts One and Two can address environmentally preferable properties and specific applications of certified forest products. Part Three can detail options for resource efficient installations, waste reduction and other site-management and production strategies that can significantly reduce overall consumption of forest products. (A list of potential CSI sections in which certified products can be specified is available from CFPC.)

2) If a given application is relatively limited, the Specification Language can be included on a line-item basis, corresponding to individual products of interest.

3) If there are to be multiple applications for certified forest products, the full text of the Specification Language can be included under a General Requirements or Definitions section with reference back to that section while employing an "FSC standard" for each specific application.

4) For public works projects or other projects in which the cost implications of utilizing certified

orest products are unknown and
his is of significant concern, a
rategy of securing alternate
ds can be employed.

hould a bid alternate be re-
uired, it is best to use certified
oducts as the primary bid and
on-certified products as the
ternate. In this manner, one
kes strategic advantage of the
ndency for deductive alternates
be minimized and additive
ternates to be enhanced. In
me instances where certified
pply is limited, it may be possi-
e to write a specification calling
r a "sole source" based on the
nique environmental properties
certified forest products and
e demonstrated stewardship
mmitments of the vendor.

Include vendor sourcing infor-
ation to facilitate ease of com-
iance with the specification by
ntractors.

If a design firm and/or their
ent desire to demonstrate a
tegorical commitment to the
e of certified forests products
all their projects, limited only
availability and affordability
nsiderations, the employment
a Master Spec strategy can
helpful in creating a template
r success. (Contact CFPC to dis-
ss Master Spec formats and
rategies.)

mple Specification Language
e following specification lan-
age is intended for use in
rchase Requisition, Request for
oposal, or Design Specification
cuments.

Definitions
ertified Well-Managed" Forests:
r the purposes of this sec-
on,"certified well-managed"
all be determined by standards
dorsed by the Forest Steward-
ip Council (FSC).

2) Submittals
For wood products, provide evidence of compliance with standards endorsed by the Forest Stewardship Council and as follows:
i) Indicate certified status of forest of origination
ii) Indicate chain of custody from forest of origination through manufacturing and fabrication.

Submit prior to fabrication and installation.

Wood products for which acceptable documentation is not submitted will be rejected and their removal required.

3) Quality Assurance
The following programs are accredited by the Forest Stewardship Council:
i) *Green Cross Certification Program*; administered by Scientific Certification Systems (SCS)
ii) *SmartWood Certification Program*; administered by Rainforest Alliance
iii) *Société Générale de Surveillance (SGS) Forestry Qualifor Programme*; administered by Oxford Centre for Innovation
iv) *The Responsible Forestry Program*; administered under Soil Association's Woodmark Scheme
v) *SKAL Forestry Certification Programme*; administered by SKAL

4) Materials
All wood products shall originate in "certified well-managed" forests.

NOTE: The Certified Forest Products Council can serve as a resource in identifying vendor sources and can assist with preparations for pre-bid meetings and in educational efforts architects deem appropriate within their firms, including providing literature about "certified wood." Contact CFPC at: specs@certifiedwood.org

Moving Towards Sustainability Through Innovative Partnerships

By David Ford, President
Certified Forest Products Council

Over the past four decades, most relationships between business and the environmental movement have been based upon conflict. This model began to change as sustainable development emerged onto the scene in the early 1990s. Sustainable development offers a new way of looking at environmental, economic and social problems. To deal with these complex and growing problems, representatives of the business community and the environmental movement are beginning to collaborate in an effort to identify alternatives and agree upon solutions.

Business-environmental group partnerships are growing in both numbers and scope. Internationally, such partnerships have emerged in the areas of sustainable forestry, air and water quality, and marine life and fisheries. Recently, the World Wide Fund for Nature (WWF) and Unilever Corp., the world's largest buyer of frozen fish, partnered to create economic incentives to promote sustainable fishing worldwide. In the sustainable forestry arena, the World Bank and WWF have formed an alliance to bring 500 million acres of productive forestland under independent certification by the year 2005.

Here in North America, a wide array of partnerships are emerging. Fast-food giant McDonald's joined with the Environmental Defense Fund in an alliance of companies, institutions, and environmental interests to reduce the impact of the production and consumption of paper products. In 1997, environmental groups, forest product related businesses, and philanthropic organizations made a bold statement of alliance with the creation of our organization, the Certified Forest Products Council. The Council is one of 12 such partnerships worldwide that are committed to building a sustainable future by improving forest management practices. Due largely to the existence of these groups, some 25 million acres of forestland in 25 countries on five continents are now under independent third-party certification.

It is becoming increasingly clear that the collaborative model based on partnerships has the potential to transform our world from an environment of conflict to one of consensus.

The design community, with its heightened awareness of the need for sustainability, is uniquely positioned to embrace the role of alliance-builder. This is particularly true in the realm of natural-resource-derived products, including the multitude of goods that originate in our forests.

The vision and direction of the design community can empower partnerships between environmental and commercial interests. These partnerships will find common ground on the big issues and the day-to-day challenges such as sourcing, purchasing, production, and distribution sustainability. And these partnerships will help drive our society toward sustainability.

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

LEARNING OBJECTIVES

- Contrast the static model of sustainability with the dynamic model.
- Describe how a forest can become certified.
- Explain the chain of custody for certified forest products.
- Write specifications for using certified forest products.

The preceding article, *Certified Forest Products: Solutions for Sustainable Design*, provided by the Certified Forest Products Council and the Pew Charitable Trusts, is part of the AIA/Architectural Record Continuing Education Series. You can receive 2 continuing education learning units that qualify for health, safety and welfare credits by reading the article, studying the learning objectives and answering the question below. Turn the page upside down to check your answers. Then return the self-report form in this issue. (See index for page number.)

QUESTIONS

1. What is meant by dynamic sustainability?

2. What has been the result of present forest management practices on our forest ecosystems? On the general business climate for forest-dependent companies?

3. How does a forest become certified as "well managed" and who certifies it?

4. What does chain of custody certification mean?

5. What are the different ways to specify certified forest products?

6. What can an architect do to extend the forest resource?

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

ANSWERS

1. Dynamic sustainability refers to on-going and continuous reaction to changes. Dynamic sustainability must constantly adapt to innovation and contribute to future generations.

Current forest management practices have led to the depletion of forest resources; to the loss of wildlife habitat; to the deterioration of both soil and water quality; and to less biodiverse forests that are are more vulnerable to insects, disease, and catastrophic fires. Current practices, based on governmental regulations, have fostered an adversarial, cautious environment that focus the attention of businesses on temporal issues instead of legacy building and sustainability.

3. The Forest Stewardship Council is an international organization that accredits third-party certifiers. There are two companies currently accredited as certifiers in the United States. The certification evaluates on-the-ground forest management according to a set of ten principles and criteria addressing such factors as management planning, maintenance of natural forests, and environmental impact. The audit evaluates the forest operation in terms of ecological responsibility, economic viability, and social benefits.

4. Chain-of-custody certification means that materials from a certified forest are documented and kept separate from non-certified materials so they can be accurately tracked throughout the manufacturing process. The chain-of-custody reaches from the forest to the final point-of-sale.

5. Certified forest products can be specified by defining that all wood products shall originate in forests certified as well-managed by Forest Stewardship Council Standards. A three part specification document can specify certified forest products in the following way: Part One - state environmentally preferable properties, Part Two - state specific applications of certified forest products, Part Three - give options for resource efficient installations.

6. Architects can help extend the forest resource by specifying a greater variety of temperate and tropical wood species and by using the full range of available wood grades.

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CIRCLE 67 ON INQUIRY CARD

NEW PRODUCTS

This month, the first two pages of New Products highlight eight projects from around the country that use the latest exterior metal cladding technology. But no matter how high-tech the metal cladding may be, its essential purpose remains the same: to separate a building's interior from the outdoors, maintaining an indoor environment suitable for the building's intended use. This means keeping water and fire out, ventilating the air, and controlling light, radiation, heat, sound, and water vapor—and, if there's a threat of seismic activity, adjusting to movement. Simple, right?
—Elana H. Frankel, Products Editor



MINNEAPOLIS'S FEDERAL RESERVE BANK ADDS SHINE TO RIVERSIDE PROPERTY

Since it was completed last year, Minneapolis's Federal Reserve Bank Building—designed by St. Louis's Hellmuth, Obata & Kassabaum (HOK), with Walsh Bishop Associates of Minneapolis as associate architects—has proved a good urban neighbor. The seven-story office tower, with its curving glass wall and adjacent low-rise operations center that stretches along the Mississippi River, has revitalized a once-tattered (albeit historic) stretch of downtown.

Gyo Obata, HOK's principal in charge of design, says that the design team looked to the site itself for architectural inspiration. They saved several historic buildings along the site, and they pulled the building back to create a public plaza that leads down to the landscaped riverfront.

The architects employed a diverse palette of materials: rough-cut limestone, precast concrete, beige brick, and extensive metal detailing. They chose metal as a counterpoint to the stone and precast concrete because "it allows us to achieve an architectural lightness and bring human scale to the street-level facade of a rather large building," says Robert Powers, a senior associate at HOK.

The metal also adds a great deal of visual interest. For such key spots as the entrance portal and arcade, as well as bands that visually frame the curving curtain wall, HOK employed silver-metallic, .125-inch aluminum panels from the UNA-FAB Modified Series 3000 Plate Panels by Copper Sales.

The main entrance was designed as a series of architectural progressions. Visitors first approach the front door under a 32-foot-high entry portal, in which square aluminum panels secured to a stud-framing system are supported by aluminum-clad radius columns atop precast abutments. The aluminum-ceilinged portal, which encircles a glass oculus that peeks at the sky, wings upward, its metallic form seemingly floating above the columns. The portal leads directly to a 105-foot-long entrance arcade, where rectangular aluminum panels are gently curved upward to form a convex aluminum ceiling. Smaller perforated panels line its periphery. The glittering metallic ceiling contrasts with the golden precast columns, creating a tunnel-like passageway that steers visitors' vision toward the front door.

Eric Kudalis is the editor of Architecture Minnesota.

Metal cladding adds visual interest to the Federal Reserve Bank facade.





Details of the curved wall (left) and an interior hallway (above).

While most people will notice the curtain wall's aluminum detailing as they drive over the Hennepin Avenue Bridge into downtown, pedestrians strolling in the building's landscaped plaza will get an up-close look at the contrasting metal, stone, and precast concrete. The curving curtain wall pulls slightly outward from the building's facade, allowing the metal panels to form a smooth blade along the edge.

In a region renowned for its bitter winters, the slick look of silver-aluminum cladding may seem a bit too cool; a warmer material or color may have been more appropriate. Yet the panels add a glittering presence as they reflect both natural and artificial light at a time of year when light is at a premium. "The metal adds highlights of light and a bit of sparkle at the base," says Powers. *Eric Kudalis*

800/426-7737. Copper Sales, Anoka, Minn. **CIRCLE 200**



WHO'S DOING WHAT WITH METAL CLADDING

This fall, Mitsubishi Chemical will introduce Alpolic Copper 4, a solid copper skin with a 4-millimeter thickness and 36-inch width (a 51-inch width will be introduced soon), and the abrasion-resistant Alpolic ISD, an image transfer system for interior displays. 800/422-7270. Mitsubishi, Chesapeake, Va. **CIRCLE 201**

► Metal front and top

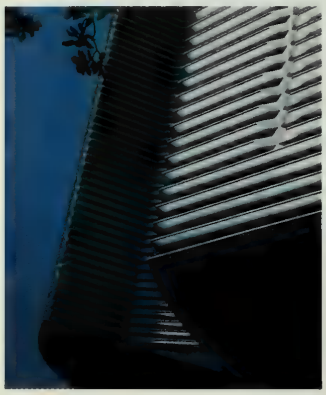
Steve Kieke, AIA, used American Buildings Company's (ABC) metal building system on B&B Specialty Metals' retail outlet in Bakersfield, California. The exterior walls of the 60-by-120-foot facility are made of corrugated galvanized steel. The building also has an ABC metal roof system. 334/687-2032. American Buildings Company, Eufaula, Ala. **CIRCLE 202**



▼ Bridge design

Architects Lohan Associates of Chicago designed the two AmSouth Bank buildings in Birmingham, Alabama, with a connecting bridge made from custom metal panels by Masonry Arts. The bridge, clad in glass block and curtain wall, has aluminum panels on the top and bottom. 205/428-0780. Masonry Arts, Bessemer, Ala. **CIRCLE 203**





▲ Ultra-high pan and batten

Custom Panel Industries' pan and batten system for metal roofing and walls has a concealer fastener panel that uses an ultra-high batten cap in heights of up to 11 inches. 909/829-8618. Custom Panel Industries, of Alta Industries, Rancho Cucamonga, Calif. **CIRCLE 204**

▼ A capital idea

The Capitol Records building in Nashville, Tennessee, used Reynolds' Reynobond aluminum composite panels in a 4-millimeter thickness and champagne metallic finish. Forming options, as illustrated below, include small radius and reverse curves as well as angles and radius corners. 804/281-3706. Reynolds Metal Company, Richmond, Va. **CIRCLE 205**





▲ Airport revival

Forty thousand square feet of Eastern Exterior Wall Systems' (EEWS) prefabricated, Alucobond-composite, Kynar-painted exterior panels and 16-gauge, Kynar-painted interior steel panels were recently installed at the Lehigh Valley (Pa.) International Airport terminal. The panels are lightweight—as light as six pounds per square foot. 800/355-EEWS. EEWS, Lehigh Valley, Pa. **CIRCLE 206**



▲ High-tech cladding

Centria was recently specified for the development of Stage Two operations at Compaq Computer's regional headquarters in Singapore. The three-story office building and two-story manufacturing facility, designed by the architectural firm Team 3, includes more than 70,000 square feet of Centria's Foamwall exterior metal cladding system and support steelwork. Centria was specified because of its properties—it's a lightweight, highly insulated composite panel system for buildings that require long spans and are located in areas with high humidity. Centria has support staff around the world. 412/299-8240. Centria, Moon Township, Pa. **CIRCLE 207**

▼ Column covers

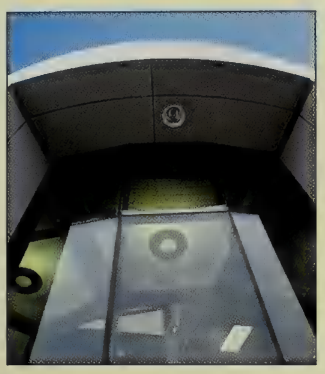
The architectural firm Page Southerland Page and the contractor Southern Architectural Systems chose alabaster-colored custom-fabricated metal from MM Systems to cover columns at the Houston Cypress Fairbanks Medical Center. Fabricated to exacting tolerances from .125-inch aluminum, each component was coated with Kynar 500 and Hylar 5000. The alabaster color was selected from MM Systems custom colors to match the window mullions and fascia trim. Seventy-two standard colors are also available. 770/938-7570. MM Systems, Tucker, Ga. **CIRCLE 208**





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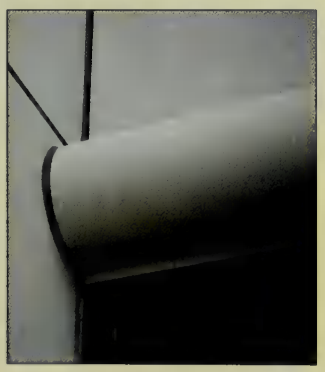




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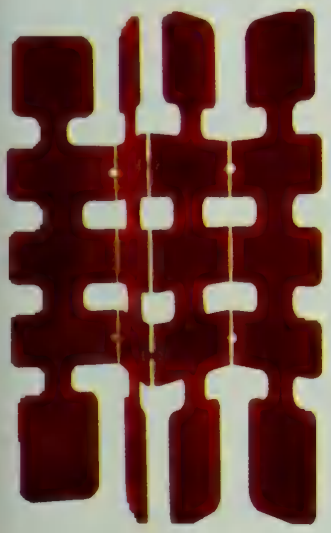
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PRODUCTBRIEFS

▼ New furniture design

Based in Manhattan's Flatiron district, architect/designers David Khouri and Roberto Guzman recently formed the company Comma and debuted their first furniture collection at the International Contemporary Furniture Fair. Screen 2 (below), one of 15 pieces in the new collection, is manufactured from ¾-inch-thick lacquered acrylic and measures 68 by 68 inches. It is available in a variety of other colors. Lighting, tables, and consoles are also part of the collection. 212/929-4866. Comma, New York City. **CIRCLE 209**





▲ Concrete and custom molds

The Scottsdale, Arizona, Pima Freeway sound barrier (above), 60 feet high at its tallest point, has become an eight-mile work of art thanks to Scott Systems' urethane form liners for concrete. Once production of the special molds was perfected, more than 20,000 square feet of urethane liners were used to design various concrete-textured cacti and a 67-foot lizard. 303/341-1400. Scott Systems, Aurora, Colo. **CIRCLE 210**

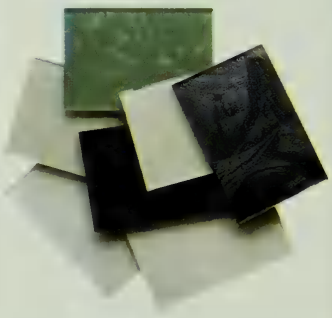


▲ Bathroom chic

Philippe Starck's latest design venture is Edition 2, a series of bathroom products that includes a one-piece porcelain toilet with an elongated bowl from Duravit. Also part of the collection is a Hoesch bathtub. 888/387-2848. Duravit, Duluth, Ga. **CIRCLE 211**

▼ Decorative acrylics

There are 20 items available in the Vitricor collection of solid-colored and metallic acrylics from Nevamar, including Mist, a low-glare version that meets ADA requirements for reflectivity, and Ice, a random-patterned acrylic reminiscent of crystal formations. Also available is Impressions, a collection of wood-grain patterns. 800/638-4380. Nevamar, Odenton, Md. **CIRCLE 212**





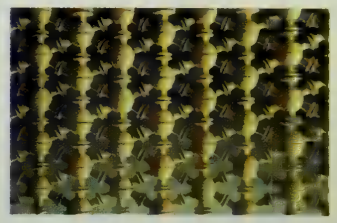
▲ Lateral files

Office Specialty's Arcus filing system is available with four 10½-inch drawers. With an overall height of 45 inches, the cabinet is ADA compliant, with a lock that is wheelchair accessible. 905/836-7676. Office Specialty, Holland Landing, Ont. **CIRCLE 213**

▼ Private office design

Margaret McCurry, a principal in the architecture firm Tigerman McCurry, has created a private office collection for HBF including tables, credenzas, side, lounge, and desk chairs, sofas, loveseats, and coordinating fabrics. Eleven types of tables made of maple with satin-nickel leg ferrules are available. 800/801-8033. HBF, Hickory, N.C. **CIRCLE 214**



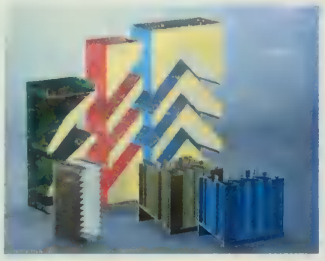


▲ Age-old craftsmanship

Ahmed Elmetwally, principal designer of Darwish Architectural Arts Studio, specializes in Zellij, a type of Moorish mosaic (right); and Mashrabia, Egyptian grillework made of spool-turned beech and mahogany (above). 212/674-5833. Darwish Studio, New York City. **CIRCLE 215**



PRODUCT BRIEFS



◄ Louver line

Greenheck, a company that manufactures ventilation equipment, has added three more louvers to its product line. The new louvers are designed to maximize resistance to wind-blown rain by protecting air-intake and exhaust openings in exterior walls. Commonly used for air-conditioning grilles. 715/359-6171. Greenheck, Schofield, Wisc. **CIRCLE 216**



▼ Building coatings

An air-dried version of Megaflon, a 100 percent thermoset (heat-cured) fluoropolymer coating, is now available in a range of building colors. Megaflon can be applied to aluminum, steel, and galvanized-steel surfaces as well as doors, window frames, handrails, and stairs. It can also be sprayed over first-generation coatings. 860/274-6701. Keeler & Long PPG, Watertown, Conn. **CIRCLE 217**

▼ Sliding patio doors

Therma-Tru's new Fiber-Classic sliding patio doors are available with prefinished white exterior panels that match the frame and have a wood-grain texture. Panels can be stained or painted. Clear, low-e, or tempered, insulated glass can be assembled directly into the door panels. 800/THERMA-TRU. Therma-Tru, Maumee, Ohio. **CIRCLE 218**





▲ Exterior protection

Ausimont's Hylar 5000 HP Plus PVDF (polyvinylidene fluoride) resin protects a building's surface coating from heat and cleaning solvents. Hylar 5000 HP Plus can be used on galvanized steel, stainless steel, aluminum, and galvalume for metal roofs, mullions, copings, and columns. 800/221-0553. Ausimont, Thorofare, N.J. **CIRCLE 219**

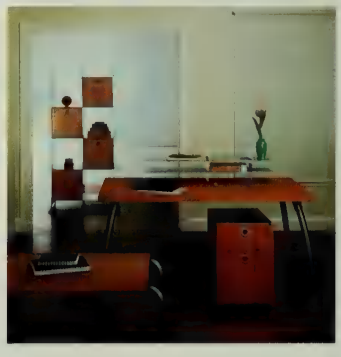


▲ Design awards on display

One of the six 1998 Felissimo Design Awards went to Maximilian Burton for Buro, a modular storage unit that folds into a cube. Winners will be on display at the Felissimo store from October 15 to November 14. 800/565-6785. Felissimo, New York City. **CIRCLE 221**

► Small office, home office

Building on the trend toward home offices and the need to provide stylish furniture for them, Kirk Hobbs has formed OFFI & Company. The company's first collection, Cerise, is designed by Brian Kane and Mark Kapka. Made from solid cherry, aluminum, and curved rolled steel legs with a powdercoated finish, the collection includes a desk and storage units. 800/383-OFFI. OFFI & Company, Berkeley, Calif. **CIRCLE 222**



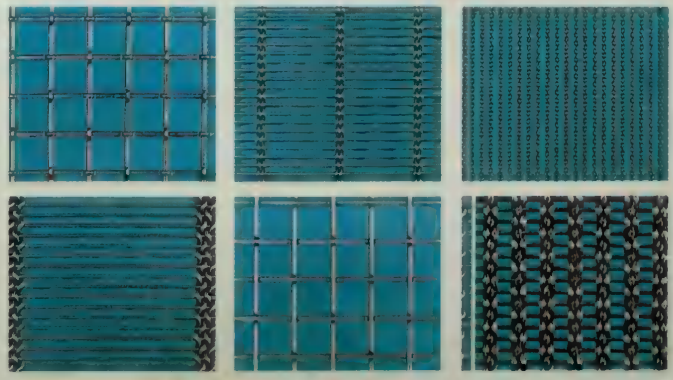
▼ Floor closer

Ingersoll-Rand's LCN 8100/8200 floor closers are designed for exterior and interior doors up to 54 inches wide and weighing up to 300 pounds. The 8100s are for offset-hung applications; the 8200s are for center-hung, single-acting applications. 800/526-2400. LCN Division, Ingersoll-Rand, Princeton, Ill. **CIRCLE 220**



► Architectural mesh

GKD has added three new stainless-steel woven meshes to its collection, for a total of 13. Lago features delicate filigree work and is based on the existing Lamelle and Sambesi meshes (top middle); Congo is a thicker mesh (bottom middle); and Kiwi is finely woven for wall coverings and infill panels for suspended ceilings and partitions (top right). Call 011/49/2421/803-0; fax 011/49/2421/803-227; or E-mail gb3@gkd.de. GKD, Düren, Germany. **CIRCLE 223**



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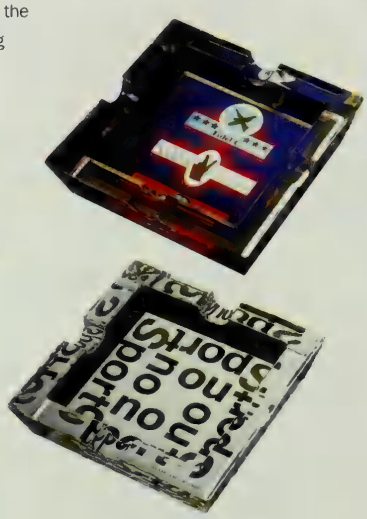
70 ON INQUIRY CARD

PRODUCTBRIEFS

▼ A thirst for product design

Since 1992, German-based Sieger Design and Ritzenhoff have been dedicated to manufacturing, packaging, and marketing a collection of milk glasses for adults and children based on designs by architects and artists around the world. For 1998, they have introduced five additions to the collection by Dutch cartoonist Dadara, Viennese designer Lo Breier, Viennese architect Davor Markovic, New York–based designer Karim Rashid (below left), and a limited-edition glass from Matthias Bohner in a Japanese comic style. This year, at Tendence, the Frankfurt design show, the team also introduced eight heavy lead crystal ashtrays packaged in cigar boxes for the new Smoking collection, including designs by German architect Volker Albus and by Kunstflug, a group of architects in Düsseldorf that includes Harald Hullmann, Hardy Fischer, and Heiko Bartels (below right). European contact: 011/49/2822/68581. Esther van der Borg GmBH, Emmerich, Germany. U.S. contact: 212/639-9660. Sorelli Imports, New York City. **CIRCLE 224**







▲ Pull up a shade

Vignette window shades from Hunter Douglas are available in three new fabrics—satin stripe, jacquard, and ribbon weave—for a total of seven fabrics and 100 hues. Shown here is a ribbon weave with a chenille-inspired texture. Called Mardi Gras silver, it is one of eight neutrals now available. Vignette protects against 99 percent of UV rays and is made of 100 percent woven polyester fabric that is anti-static as well as dust- and stain-resistant. 800-HD-SHADE. Hunter Douglas, Upper Saddle River, N.J. **CIRCLE 225**

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PRODUCTBRIEFS

▼ Seating trends

The ICF Group's Miss B indoor/outdoor furniture collection by Italian designer Tito Agnoli includes the chairs shown here. The seats and backs of the tubular metal pieces are available in leather cord and Krilon, a new nylon material that is nontoxic, fire-resistant, and easy to wash. The chairs are available in several finishes, including satin stainless steel, and can be ordered with a swivel base. 212/388-1000. ICF, New York City. **CIRCLE 226**



▼ Environmentally sound board

Isobord, from Isobord Enterprises, is a 4-by-8-foot engineered panel made of chopped wheat straw and a synthetic polymer resin pressed into long strips. Similar to medium-density fiberboard, Isobord is 15 percent lighter than most wood products and does not use formaldehyde in the manufacturing process. It exceeds ANSI-M3 standards and can be used for countertops, cabinets, and furniture. 503/242-7345. Isobord Enterprises, Elie, Man., Canada. **CIRCLE 228**



▼ 1930s glamour

Inspired by the work of Marion V. Dorn, who designed textiles from the 1920s through the 1960s, the Waldorf area rug is available in custom sizes and color palettes. Made from 100 percent virgin wool, this rug is the first of many Dorn designs now being exclusively reproduced by the Edward Fields Design Studio. 212/310-0400. Edward Fields, New York City. **CIRCLE 227**





▲ Parlez-vous français?

Fabrice Berrux, a Parisian designer at Dix Heures Dix, has created Piou-Piou, an epoxy-lacquered bird cage that holds CDs. For use in commercial or residential settings, the CD holder is available in two sizes (for 120 or 168 CDs) and two colors. Call 011/33/1/43-40-74-60 or fax 011/33/1/43-40-74-85. Dix Heures Dix, Paris. **CIRCLE 229**



PRODUCTBRIEFS

► More Starck

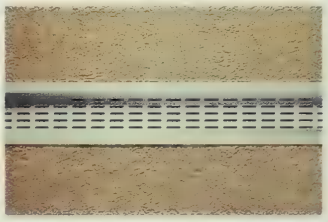


Axor, a division of Hansgrohe, and Philippe Starck have teamed up to create a new faucet that takes its shape from an old-fashioned hand pump. The ADA-compliant, single-lever control, made of solid brass, is available in a chrome finish. Lifetime warranty. 800/719-1000. Hansgrohe, Cumming, Ga. **CIRCLE 230**

▼ Clean-finish EIFS

Fry Reglet's CleanFinish EIFS soffit vent, made of extruded aluminum, is installed after the EIFS. Because its flanges cover the EIFS terminations, CleanFinish requires no masking or clean-up. Photos below show vent before installation (left) and after (right). Available in clear or anodized paint finishes and vented reveal widths of two, three, and four inches. 800/237-9773. Fry Reglet, Alpharetta, Ga. **CIRCLE 232**





► Express delivery



Since 1997 the Arizona-based company A/E/C Express has provided same-day digital delivery of more than 1,000 large-format drawings and plan-sets. A/E/C Express operates a private satellite service, which is accessed directly or through the Internet by licensed partners. The company has set up a network of more than 50 locations around the United States (in New York, California, Texas, and other states) and plans to add another 50 metropolitan areas here as well as international destinations by early next year. 888/AEC-EXPRESS. A/E/C Express, Scottsdale, Ariz. **CIRCLE 231**

► Cooking equipment



The new line of Le Cornue ranges includes the Grand Maman in a standard 36 by 24 by 26 inches with a vaulted electric oven and five gas burners, one with a blast of 20,000 BTUs. The Grand Maman is available in 12 colors, including black, blue, green, white, and stainless steel with chrome or brushed-brass trim. 800/892-4040. La Cornue, Brisbane, Calif. **CIRCLE 233**

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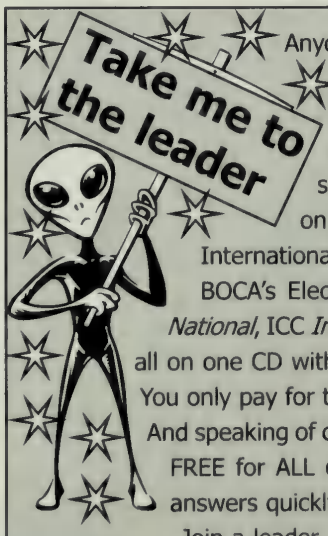
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PRODUCTBRIEFS

▼ Reinventing the fence

Métal-Tech's Omega fencing system is available in eight-foot sections; in heights of four, five, six, or eight feet; and in three standard and eight optional colors. The fence's new square-shaped post is available in two- and three-inch widths with adjustable attachment brackets. The fence can be assembled in less than 24 hours and is flexible enough to follow the contours of uneven terrain. 800/836-6342. Métal-Tech, Montreal. **CIRCLE 234**







▲ Roll and fold

The Nergeco line of high-speed doors from Chase Industries includes DuraRoll (left) and DuraFold (right). DuraRoll doors have a soft-bottom edge for safety; built-in draft resistance; and a door panel designed to release from the side guides. An optional self-diagnostic control panel is also available. The door's standard opening speed is 48 inches per second. DuraFold exterior doors have a bottom-up folding design and self-supporting side frames. The bottom 18 inches of the door panel are flexible and can be impacted and dislodged from the side frames without damaging the door panel. The door's standard opening speed is 32 inches per second. 800/543-4455. Chase, Cincinnati. **CIRCLE 235**

▼ Trim and fascia

Louisiana-Pacific's SmartStart trim and fascia have been developed to complement the company's exterior cladding products. Manufactured in various thicknesses and widths, each panel comes in 16-foot lengths. SmartStart trim and fascia is treated against fungal decay and wood-destroying insects. 800/648-6893. Louisiana-Pacific, Portland, Oreg. **CIRCLE 236**



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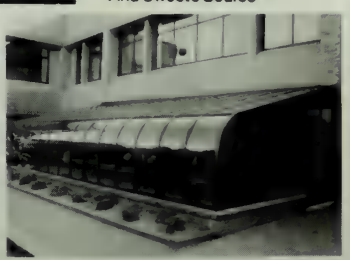
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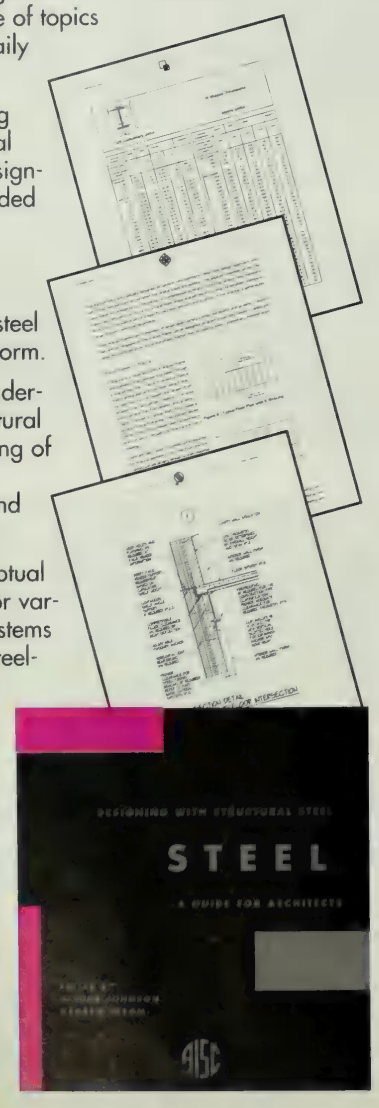
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Virtual showroom

The Virtual Design Centre CD-ROM provides a comprehensive listing of British furniture outlets. 011/44/171/928-7248. Virtual Design Centre, London. **CIRCLE 237**

Outdoor lighting

A new catalog features Architectural Landscape Lighting's line of outdoor lighting. 714/668-3660. Architectural Landscape Lighting, Santa Ana, Calif. **CIRCLE 238**

Woodworking resource

The National Labor-Management Committee for the Custom Woodworking Industry has a new directory. 202/546-7533. NLMCCWI, Washington, D.C. **CIRCLE 239**

Railing systems

Hollaender's software has data on railing systems for steel structures. 800/772-8800. Hollaender, Berea, Ohio. **CIRCLE 240**

Ambient temperature

AlliedSignal's "Cold Applied Systems" outlines ambient temperature processes in commercial roofing. 800/221-6490. AlliedSignal Roofing, Cary, N.C. **CIRCLE 241**

Garage door specs

Raynor's RaySpec CD includes information on commercial sectional doors. 800/4RAYNOR. Raynor, Dixon, Ill. **CIRCLE 242**

Surface-mounted lighting

Prescolite Moldcast's catalog has information on surface-mounted lighting. 510/562-3500. Prescolite Moldcast, San Leandro, Calif. **CIRCLE 243**

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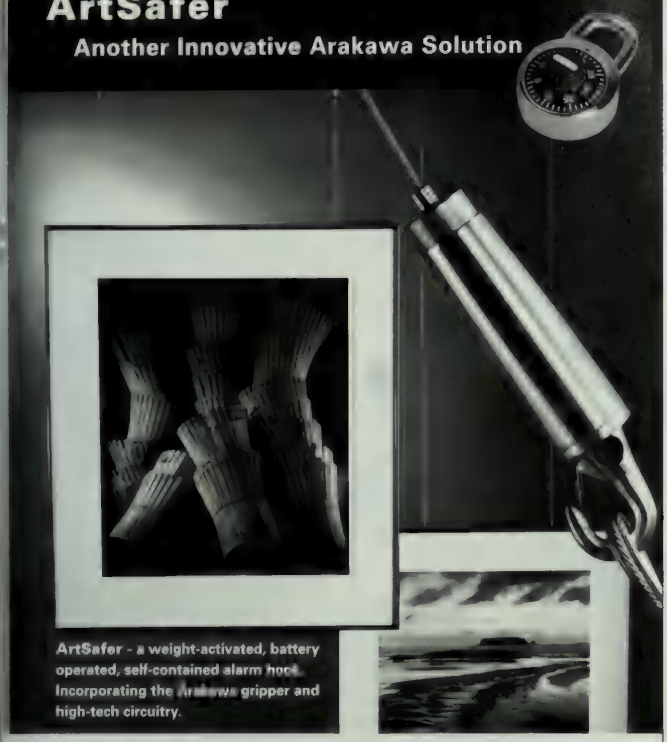
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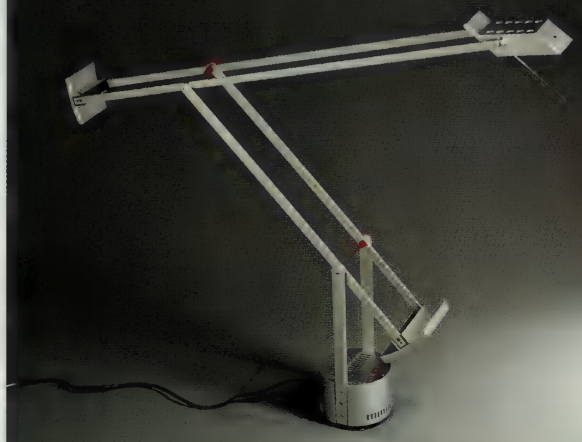


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Tile source

Ann Sacks Tile & Stone, a new book from Rizzoli, highlights projects that feature unique tile designs. Scheduled for November release. 800/52-BOOKS. Rizzoli, New York City. **CIRCLE 245**

Modern lifts

Author Roger Howkins and *Elevator World* magazine have teamed up to produce the *Lift Modernisation Design Guide*. 800/730-5093. Elevator World, Mobile, Ala. **CIRCLE 246**

Windows, doors, and skylights

The seventh edition of the National Fenestration Rating Council (NFRC) certified products directory has U-factor, solar heat-gain coefficient, and visible transmittance ratings for 40,000 windows, doors, and skylights. 301/589-6372. NFRC, Silver Spring, Md. **CIRCLE 247**

Computer-managed control

Locknetics Security Engineering has released a revised, eight-page color brochure on their Intelligent by Design systems and software. 860/584-9158. Locknetics Security Engineering, Forestville, Conn. **CIRCLE 248**

Door hardware

Hardware Assistant, PC-based software from Colonial Bronze, displays 10,000 design and finish hardware combinations. 860/489-9233. Colonial Bronze, Torrington, Conn. **CIRCLE 249**

Building product software

Building for Environmental and Economic Sustainability (BEES) software, from the National Institute of Standards and Technology (NIST) Green Buildings Program, measures the environmental performance of various building products. The software measures product performance by using the environmental life-cycle assessment approach specified in the latest version of ISO 1400 draft standards. 415/543-3001. NIST U.S. Green Building Council, San Francisco. **CIRCLE 250**

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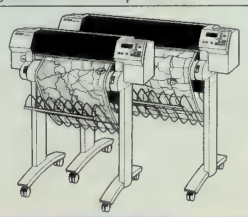
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AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

Instructions

- Read the article "Living and Working within the Code" (page 171) using the learning objectives provided.
- Complete the questions below, then check your answers (page 210).
- Fill out and submit the self-report form (page 210) or file the form on ARCHITECTURAL RECORD's Web site (www.archrecord.com) to receive two AIA Learning Units.

Questions

1. When were building codes first published in the United States, and why were they published?

2. What is the best way for an architect to get his or her building through the code process?

3. How do codes help architects design?

4. What are the benefits of the new International Code Council code proposed for 2000?

5. How is a performance code different from a prescriptive code?



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ANSWERS

Questions appear on page 208. To receive CES credits, fill in the self-report form below or on our Web site (www.archrecord.com).

1. The first building code in the United States was published in 1875, two years after the great fire in Chicago. Building codes are continuously created and revised in response to specific catastrophes. Their purpose is to protect the community by preventing construction of buildings that could be dangerous.

2. Building projects make their way through the code-review process with less conflict and fewer design changes when the architects involved educate themselves about current regulations. Architects should think about code ramifications early in the design process, and keep up communications with code officials throughout the project. Ideally, an architect should meet with code officials early, during the schematic phase of design if possible, and before designs are approved by the client. If new technology is being used, or there is something unusual about the building, even more involvement with code officials may be required. Under these circumstances, it's often worth talking to a code consultant or specialist who can help secure the documentation the code officials need to understand the technology and see that it meets safety criteria.

3. Codes help architects by defining basic safety design standards. This frees architects from the need to research basic safety issues for each type of building project. Codes are a compilation of safety standards that have been accumulated over centuries; when used properly, they free an architect from having to reinvent the wheel each time he or she is asked to design a certain type of building. Since basic safety is already defined in codes, architects can focus their efforts on other areas and start work on a higher level.

4. The major benefit of the International Code Council's proposed International Building Code is that it creates a single, uniform code that may be adopted internationally. This saves architects from having to familiarize themselves with the three different model codes and their various permutations now in effect in different localities. The international code will establish consistent, predictable criteria to govern design and construction nationwide. One uniform code is also more likely to be taught in architecture schools, which have in the past focused little attention on health, safety, and welfare issues.

5. A performance code states what the object of the code is or what it is supposed to provide or prevent. It is up to the architect to provide test results or documents to prove that the design solution satisfies the intent of the code. A prescriptive code outlines what the acceptable design solution is using specific charts, tables, and instructions.

AIA/CES SELF-REPORT FORM

(Use to report learning units earned for ARCHITECTURAL RECORD only.)

Member information:

Last Name **First Name** **Middle Initial or Name**

AIA ID Number

Program/project title: Architectural Record (10.98)

Check the following as applicable:

☐ "Living and Working within the Code" (page 171)

☐ "Break-Through Technology Heightens the Performance of Windows and Doors" (page 176)

Section sponsored by Marvin Windows and Doors

☐ "Certified Forest Products: Solutions for Sustainable Design" (page 181)

Section sponsored by the Certified Forest Products Council, the Pew Charitable Trust, and the W. Alton Jones Foundation

Completion date (M/D/Y): _____/_____/_____

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I hereby certify that the above information is true and accurate to the best of my knowledge and that I have complied with the AIA Continuing Education Guidelines for the reported period.

Signature **Date**

Send completed form to University of Oklahoma, Continuing Education, AIA/CES, Room B-4, 1700 Asp Avenue, Norman, OK 73072-6400. Fax 405/325-6965. Or, to respond by E-mail, visit www.archrecord.com and click on Continuing Education. For additional information, call 800/605-8229.

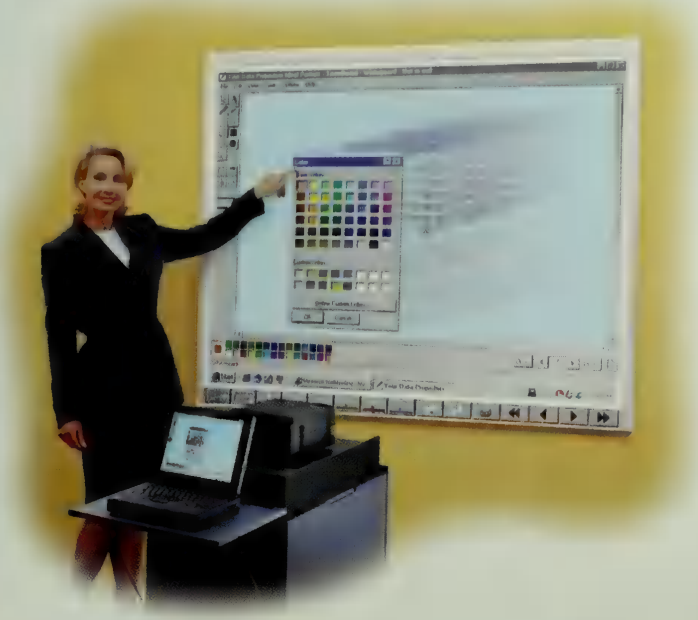
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(continued from page 81)

Ezra Stoller: The Frank House
New Haven, Conn.
October 26–November 13
Stoller's 1941 photographs of Gropius and Breuer's Frank House in Pittsburgh capture this important but relatively unknown residence. Art + Architecture Building, Yale University. For information, call Esto Photographics, 914/698-4060.

design.y.c.
New York City
October 27–30
Four major design events have been merged to create one show: Interplan '98, the East Coast's largest interior planning and design expo; ASID's Design Power, an educational conference oriented toward the design-builder; the Design Show, for residential specifiers; and Batimat Design-Build, featuring exterior and interior products and services for design-builders. Javits Convention Center. Call 800/950-1314 x2331.

AIA Leadership Institute
Chicago
October 29–November 1
Los Angeles
November 19–22
The AIA has teamed with the National Leadership Institute to offer this three-day course in leadership skills for architects. AIA members receive a substantial discount off the normal cost of the program. To register, call Emily Cole, manager of AIA Continuing Education, at 202/626-7445.

Symposium on Healthcare Design
San Francisco
November 19–22
The health-care design industry's premier conference includes three days of plenary sessions, an exhibition of products and services, an awards banquet, and tours of local health-care facilities. Call the Center for Health Design at 800/955-1226 or visit www.hcaredesign.com for details about registering and exhibiting.



Competitions

Accent on Architecture Grants
Submission deadline: October 9
Matching grants of up to $3,000 are offered to local organizations for outreach programs that result in an increased public awareness, appreciation, and understanding of how involvement in the design process can enhance the quality of life in a community. Write American Architectural Foundation, 1735 New York Avenue N.W., Washington, D.C. 20006, call 202/626-7300, or fax 202/626-7420 for information.

Tilt-Up Achievement Awards
Submission deadline: October 15
The Tilt-Up Concrete Association (TCA) announces its sixth annual awards to recognize tilt-up structures that are outstanding in their aesthetic appeal, creativity of design, application of materials, or advancement of the industry. Construction must have been completed by September 1, 1998, and the building team must include at least one member of the TCA. Write TCA, 107 First Street West, P.O. Box 204, Mount Vernon, Iowa 52314, or call 319/895-6911.

Library for the Information Age
Registration deadline: October 15
Submission deadline: January 31, 1999
The first international Web-based architectural design competition, sponsored by the Association for Computer-Aided Design in Architecture, calls for the design of a library that takes full advantage of information technology while still serving the library's roles in culture and society. Proposals may incorporate spatial simulation and/or physical solutions. Open to student and professional designers worldwide. For information, visit www.acadia.org/competition/.

(continued on page 216)

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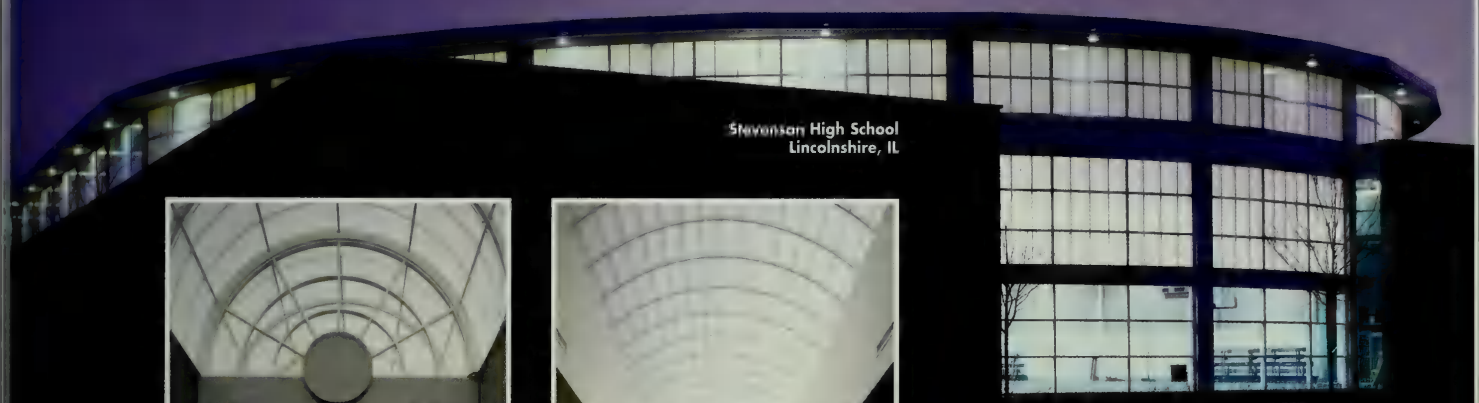
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CIRCLE 89 ON INQUIRY CARD

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Houses Designed for Narrow Lots
Registration deadline: October 15
Submission deadline: December 10
This competition is to design a prototype affordable, three-to-four-bedroom house for narrow lots in Minneapolis's Powderhorn Park neighborhood. The winner will be commissioned to design his or her proposal. For registration information, call the Powderhorn Park Neighborhood Association at 612/722-4817 or visit www.mhponline.org/ppna.

Concrete Bridge Awards
Submission deadline: October 23
Concrete bridges completed between October 1996 and October 1998 are eligible for this competition, sponsored by the Portland Cement Association. Call Basile Rabbat at the PCA, 847/966-6200, or E-mail Basile_Rabbat@portcement.org.

Design a Conservatory, Win a Conservatory
Submission deadline: October 26
Sponsored by David C. Bishop and Co., this contest focuses on a garden room theme, including the creative use of furnishings in both the interior and exterior landscape. The winner will receive a freestanding 12-foot octagonal conservatory created for this event. Call the Merchandise Mart at 847/729-9812 or visit www.conservatories.net.



Concept House '99
Submission deadline: October 30
Architects, designers, and product designers are invited to create a scheme for a speculative British terraced urban home, to be located on a brownfield site. The winning project, which must address broad ecological issues, will be constructed for the 1999 Ideal Home Exhibition. Administered by the Royal Institute of British Architects. For more information, call Louise McKinney, 011/44/113/234-1335.

Louis Armstrong High School for the Arts
Registration deadline: October 30
The Acadiana Educational Endowment and software makers auto.des.sys, Inc. are sponsoring a competition to design a high school for the arts in Acadiana, Louisiana. The competition is open to students worldwide and will take place in two stages over the 1998–99 school year. Call 614/488-8838 or E-mail formz@formz.com for details.

DuPont Antron Design Award
Submission deadline: October 31
Professional architects and interior designers are invited to submit projects that show a creative use of DuPont Antron nylon carpet. Entries must be permanent commercial interior projects completed between October 1, 1995, and October 1, 1998, and use Antron carpets only. Contact the Design Award Center at 800/458-4329 for details.

USITT Architecture Awards
Submission deadline: November 9
The United States Institute for Theatre Technology (USITT) gives awards for new theaters or theater renovations completed after January 1, 1989, honoring creative image, contextual resonance, use of new technology, community contribution, and functional operation. For awards criteria and entry information, call USITT at 800/938-7488, E-mail usittno@pppmail.appliedtheory.com, or visit www.usittt.org.

Intern Development Program Outstanding Firm Award
Submission deadline: November 13
Sponsored by the AIA's Intern Development Program, this award honors architecture firms that give outstanding support to interns by providing comprehensive training opportunities, promoting mentorship and participation, and encouraging supplementary education activities. For an entry form, call David Roccosalva at the AIA, 202/626-7325.

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(continued from page 216)

Steel Joist Institute Design Awards
Submission deadline: November 13
These awards recognize outstanding design in steel joist construction, judged on the basis of flexibility, speed of construction, cost, and aesthetics. Projects must have been built in the United States, Canada, or Mexico in the last three years. Write the Steel Joist Institute, 3127 10th Avenue, North Extension, Myrtle Beach, S.C. 29577, or visit www.steeljoist.org.

Cyborg City: Mechanical Islands for New York
Submission deadline: November 15
The Urban Studies and Architecture Institute is sponsoring this competition, in which entrants design artificial islands for New York's waterways. Those who have earned university degrees in the last 10 years, as well as current students of architecture, landscape architecture, interior design, and urban design, are eligible. For details, call 212/727-2157, fax 212/727-2159, or E-mail Ldusainst@aol.com.

Rome Prize Competition
Application deadline: November 15
Each year the American Academy in Rome offers fellowships that provide a stipend, room and board, and work space at the academy in Rome. Fellowships—available in 18 disciplines including architecture, urban planning, urban design, interior design, historic preservation, and landscape architecture—are given to fund independent projects for periods ranging from six months to two years. Call 212/751-7200 for an application.

Rudy Bruner Award for Urban Excellence
Submission deadline: December 18
This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives $50,000; silver medalists receive $10,000. Call 617/492-8401 or E-mail info@brunerfoundation.com for more information.

London AIA Excellence in Design Awards
Submission deadline: January 15
The awards program honors excellence in architectural design for work completed between January 1, 1993, and December 31, 1998. Eligible are projects by U.K.-based architects working anywhere in the world; projects in the U.K. by architects from anywhere in the world; and projects in the U.K by U.K.-based students. For more information, write AIA, Kent House, 14–17 Market Place, London W1N 7AJ, or fax 011/44/171/636-1987.

James Beard Foundation/ Interior Design Magazine Awards
Submission deadline: January 29
Established in 1995 to honor excellence in interior and graphic design for restaurants, these awards are for projects in the United States and Canada. For information, write the James Beard Foundation, 6 West 18th Street, 10th floor, New York, N.Y. 10011 or visit www.jamesbeard.org.

Union Internationale des Architectes Student Competition
Submission deadline: January 31
Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. Call Liu Kecheng at Xi'an University, Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn for registration information. ■

Please submit information for events and competitions at least six weeks prior to the magazine's publication date (e.g., November 15 for the January issue).



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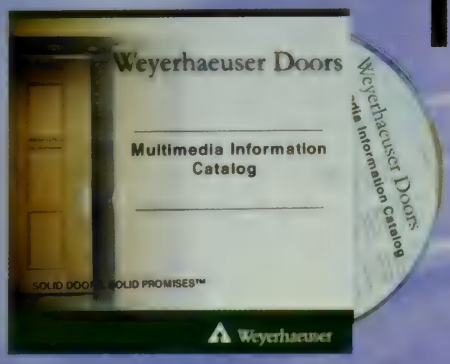
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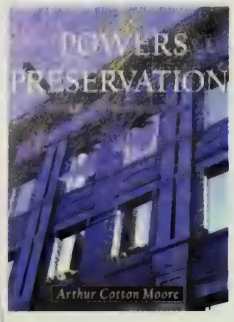
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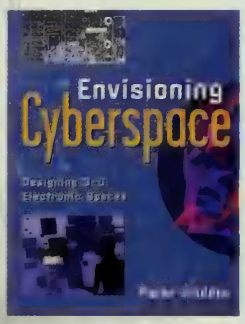

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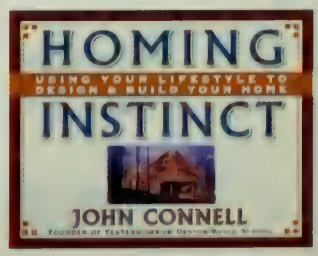
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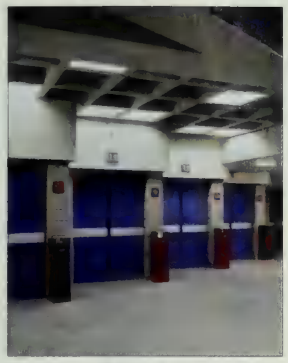


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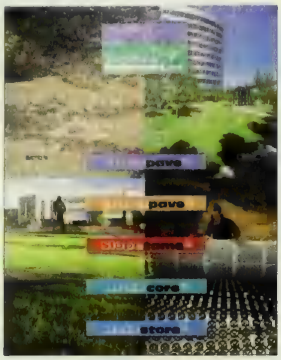
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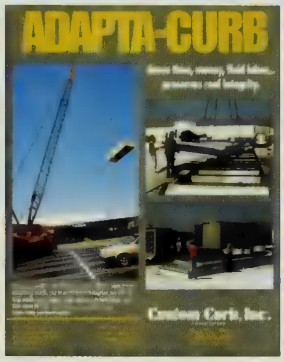


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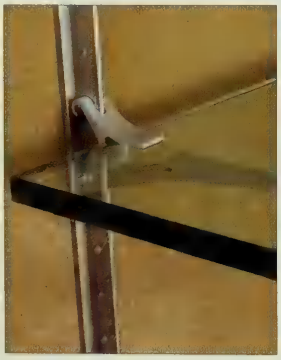


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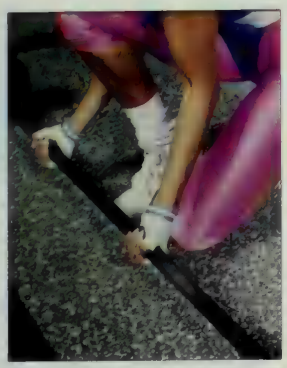
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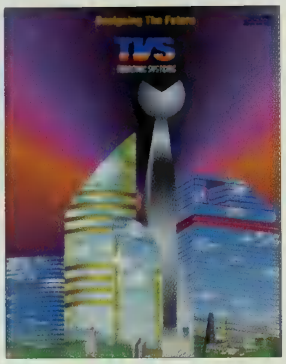


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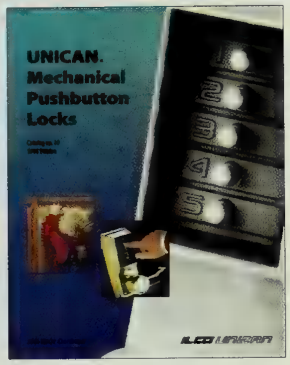


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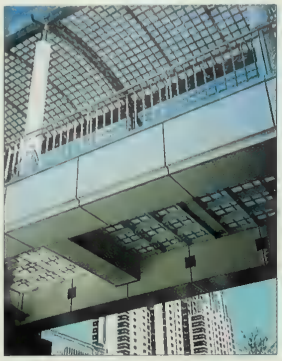
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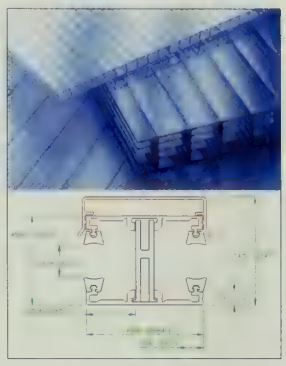


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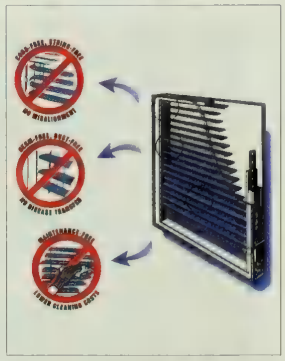


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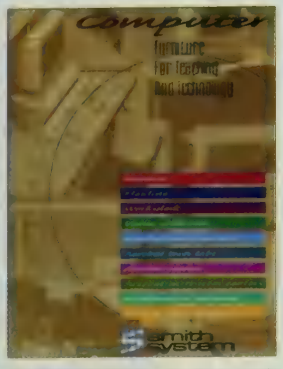
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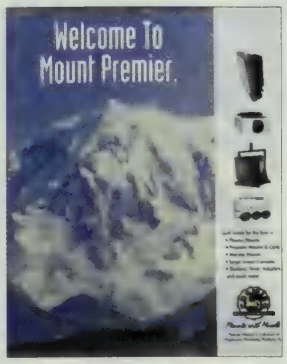


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THE FUTURE Why are we flushing toilets with water good enough to drink?



BY KIRA L. GOULD

Each year, California sucks 4 million acre-feet more water from the Colorado River than it has rights to. In Texas, development and an archaic "right of capture" water policy have strained the Edwards Aquifer, the booming San Antonio area's sole water source. And southern Florida's 1940s man-made flood-control system destroyed the area's natural hydrological system. Miami architect Dan Williams, an expert on hydrology and land use, estimates that in the last 50 years ill-conceived development has diminished the world's supply of drinkable water by more than a third.

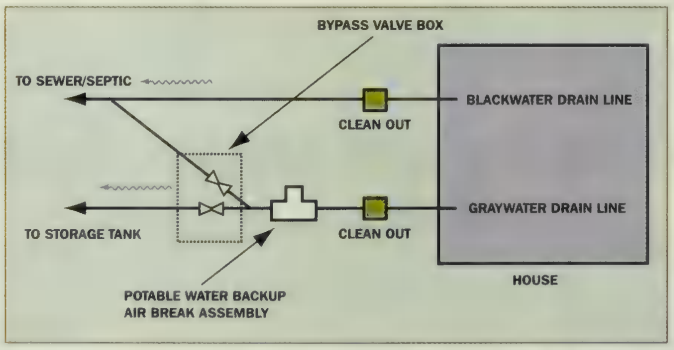
The threat of water overuse and shortages are only beginning to hit the American consciousness. A few communities do have water restrictions and "water police" to enforce them, and for years companies have been marketing water-conservation technologies, such as graywater recycling devices, to homeowners.

"In Florida, we are not going to run out of water, but we are furiously working on aquifer storage recovery, we have desalination plants working overtime, and the cost of water is going to keep rising," says Steven DelleCave, president of Mangrove Companies, a Naples-based maker of home graywater systems. (Graywater is wastewater from baths and showers, clothes washers, and sinks; blackwater is wastewater from toilets and dishwashers.) Plumbing systems can be modified to isolate blackwater and make graywater available for reuse in toilet flushing or irrigation.

In most houses, graywater and blackwater go down the same drain, causing an average family to waste some 41,000 gallons of recyclable water a year. To combat such waste, several thousand home-owners across the country have employed graywater systems, saving money while reducing the drain on local water supplies.

But the vast majority of houses and commercial facilities—especially hotels, with their hundreds of toilets and showers and dozens of laundry machines—are still wasting water. They could save money on water bills by installing graywater systems, savings that will only increase as water costs escalate. Where a homeowner may save hundreds of dollars a year, commercial concerns could save tens of thousands. According to Art Ludwig, author of *Builder's Greywater Guide* and *Create an Oasis with Greywater* (Oasis Design, 1997), "Payback on even the most elaborate, expensive system would come relatively quickly for a hotel that runs a large laundry operation and needs irrigation for its landscaping."

Part of the reason businesses are not adapting to graywater systems is that they are prohibited by most state plumbing codes because of health concerns about irrigating with nonpotable water. Last year California expanded the graywater codes to include some commercial, industrial, and multifamily uses. But designers and environmentalists are disappointed with the new law. "There are a few provisions of the law that pull the rug out from under the economic viability [of conversion to graywater]," Ludwig says. "In addition to requiring a redundant conventional disposal system, the law requires that there be twice as much area to be irrigated as the amount of graywater you anticipate reusing. So for proper irrigation, you also need a redundant freshwater irrigation system. Building two systems is probably not a bad idea, but three is ridiculous."



Nevertheless, some businesses that have tried graywater systems have found success. Larry Callahan, general manager of the Post Ranch Inn in Big Sur, California, installed a graywater system four years ago. "We use sand to filter the water and put it in a fenced field. Recycled tire tubing lies 14 inches underground, forming the drip irrigation system."

Graywater is used for a drip irrigation system at the Post Ranch Inn (above). Mangrove's home graywater system is diagrammed below.

Callahan has installed such systems before and is preparing to build a blackwater restoration pond at his resort in Fiji. "Every system I've completed has paid off within a year," he says. "In Big Sur, we need to be able to do laundry and reuse that water; the payback—for not using more water and not traveling to town to do laundry—is immediate. If business owners looked at all aspects of water use, they would understand the financial viability quickly."

Setting up separate plumbing systems in new construction projects now to handle graywater in the future may be the most progressive move possible. "My advice is to make sure that the infrastructure is in place, because retrofits will be very expensive," DelleCave says. For architects, this means collaborating with builders and engineers to make these options available to clients; especially in areas where water is scarce, this is clearly a value-added service. Like many aspects of sustainable design and construction, twin piping systems might seem like a hassle. But tackling this growing environmental challenge now is helping some architects feel more socially and environmentally responsible—and could turn out to be a financial boon. ■

Kira L. Gould is a freelance writer living in New York.

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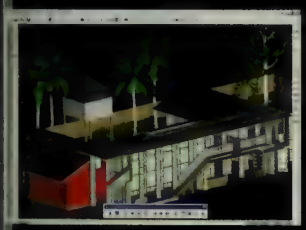


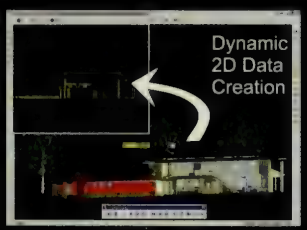
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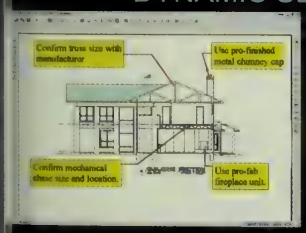


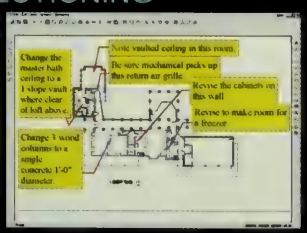
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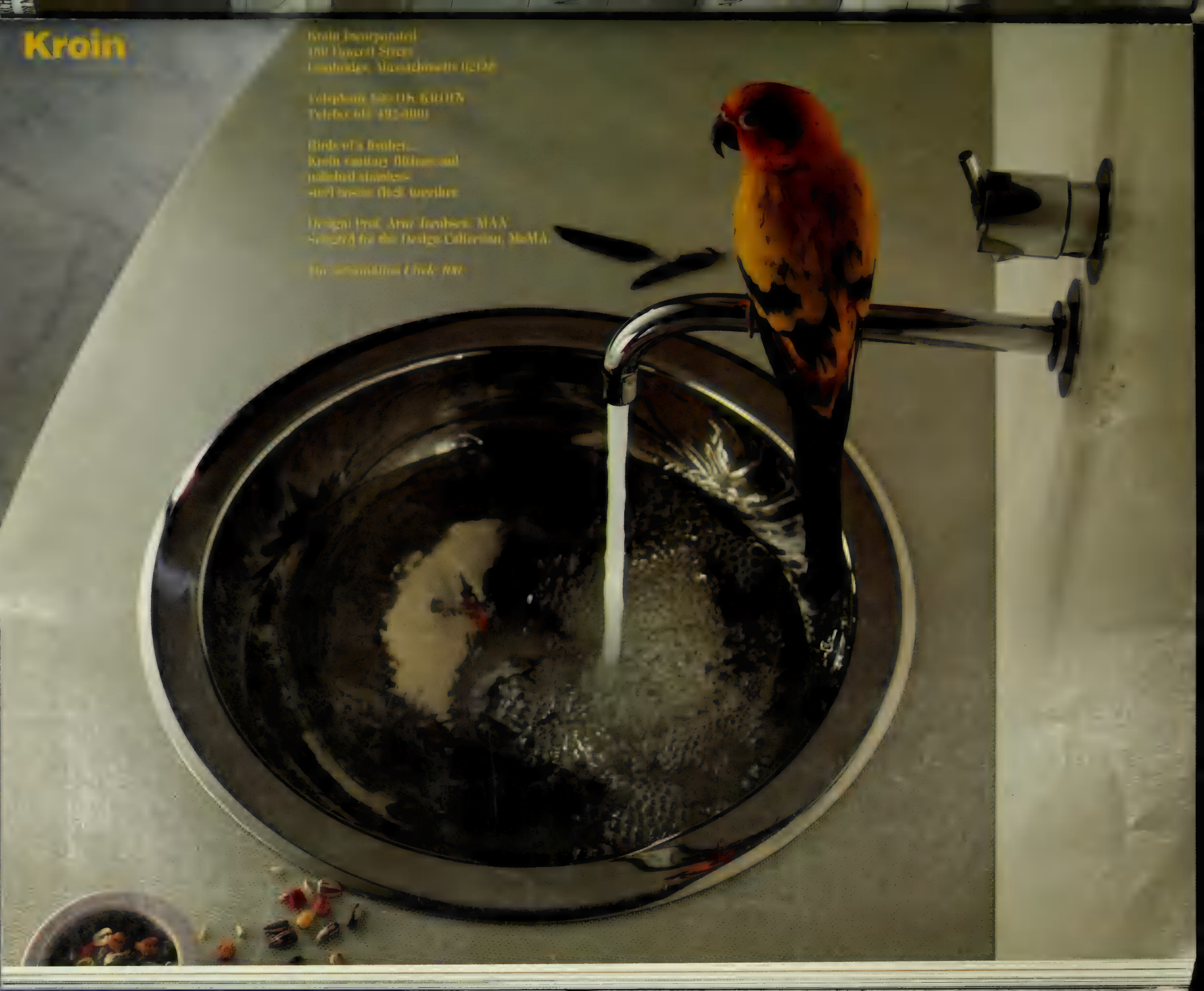


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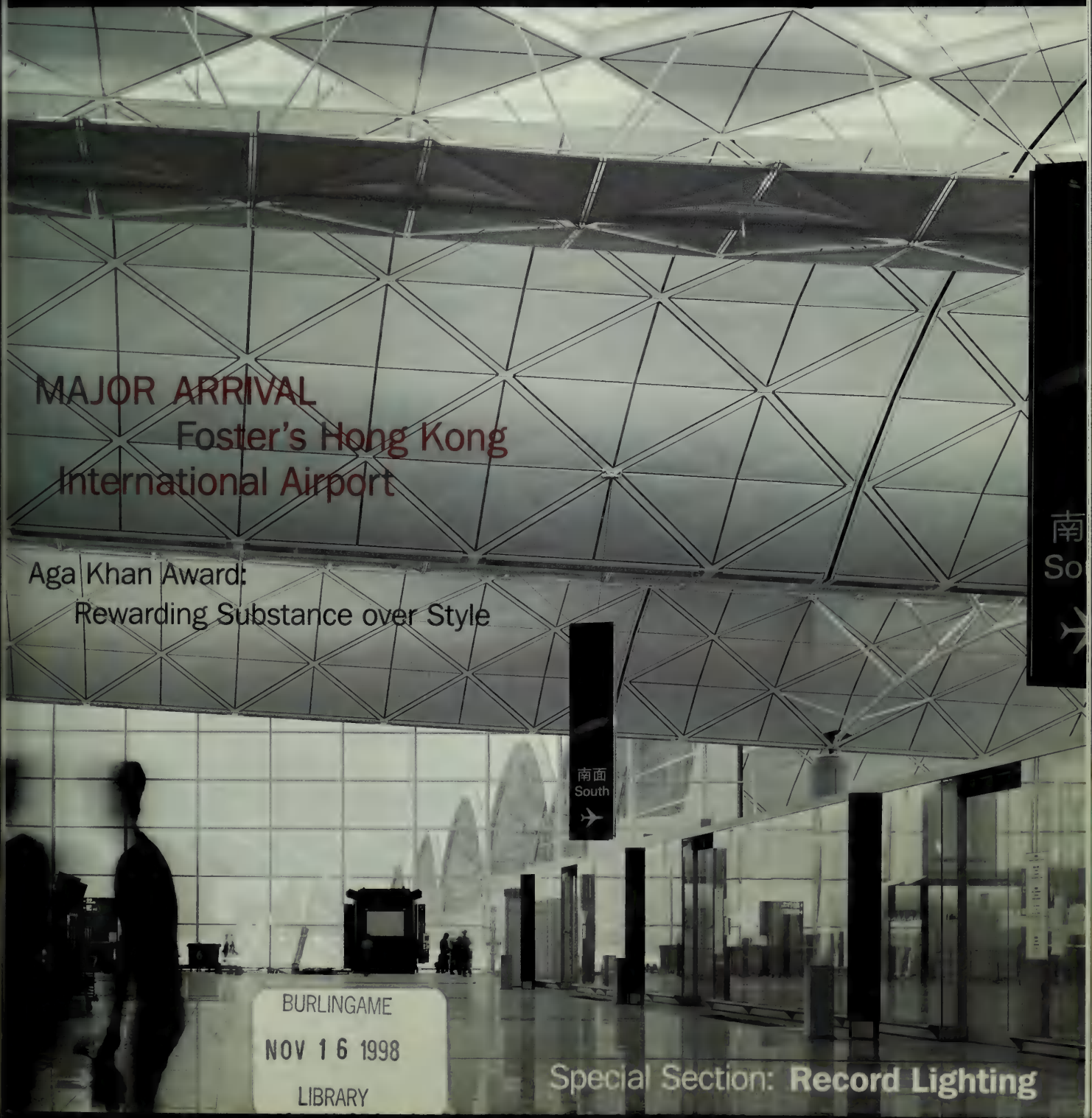
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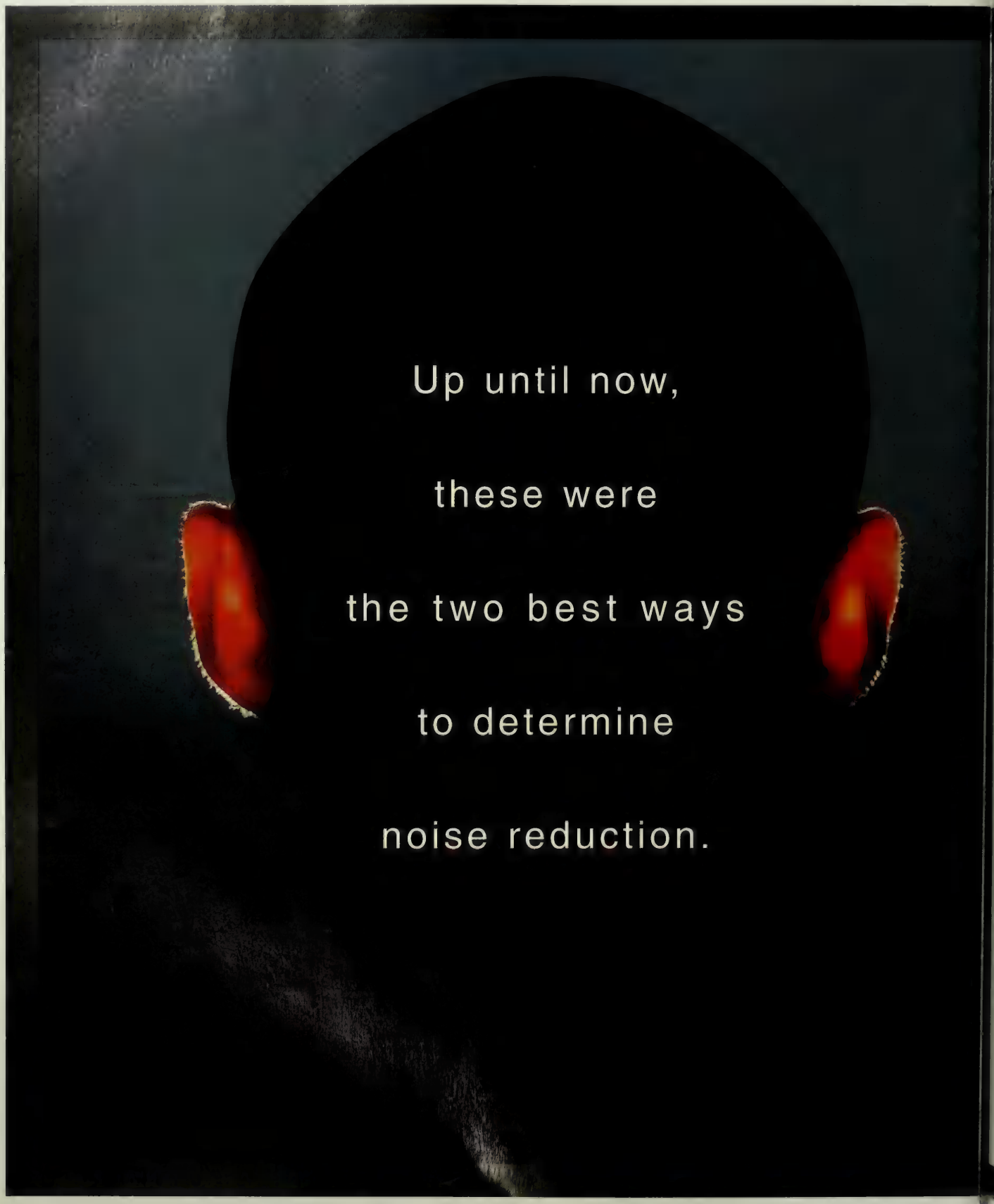


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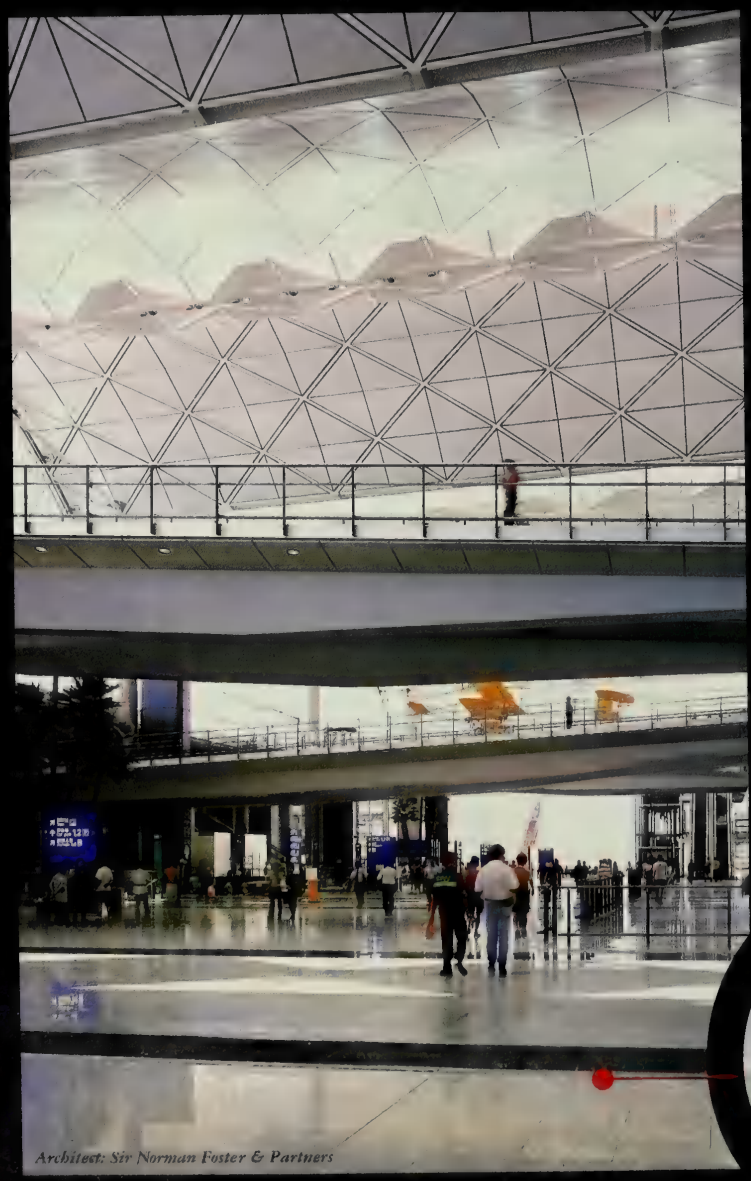
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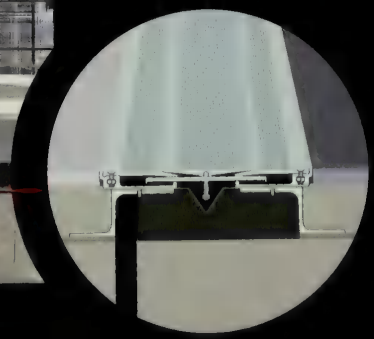
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Continuing Education: *The AIA/ARCHITECTURAL RECORD continuing education opportunity this month is "Restoring a Nebraska Landmark" (page 133). The self-report from appears on page 194.*

Cover: *Hong Kong International Airport, Hong Kong. Foster and Partners. Photograph © Dennis Gilbert/VIEW.*
Above: *Lepers Hospital, Chopda Taluka, India. Photograph © Ram Rahman, courtesy Aga Khan Foundation. See story beginning on page 68.*



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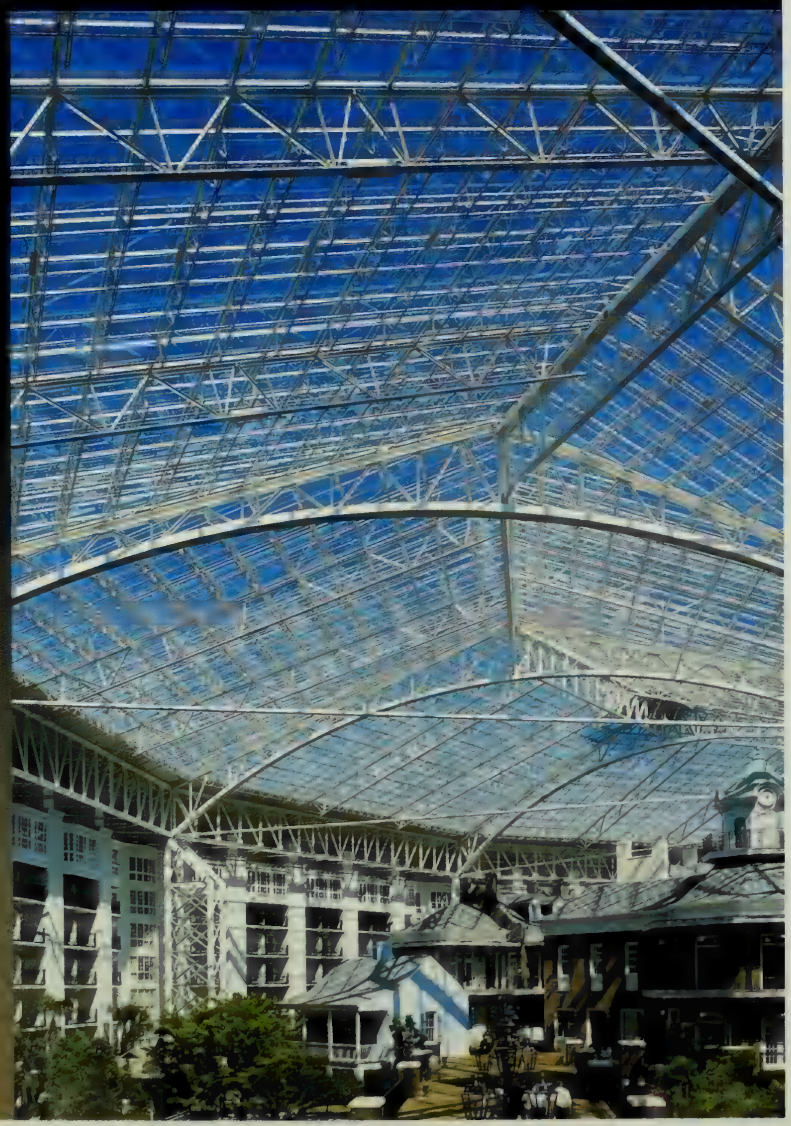


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EDITORIAL

Setting High Standards

BY ROBERT IVY, FAIA

We are entering the season of formal wear. The proliferation of black-tie evenings related to awards ceremonies, and the consequent investment of our time and money in entry fees and office time, begs us to scrutinize the honors and awards phenomenon, pruning and improving the programs to suit our needs.

Unfortunately, the honors and awards process can often be faulted for superficiality or for appearing self-laudatory. The results, arrived at in three or four hours, can appear like the in-crowd patting itself on the back.

Take heart. A new generation of architectural awards is redefining the entire process, elevating standards of quality and thoroughness with increasing sophistication. The American Institute of Architects, through its Honors and Awards Task Force, has been addressing the question head-on, cutting back outdated programs and tightening standards. The General Services Administration, America's largest landlord, has instituted a far-ranging design excellence program—a federal initiative with positive implications for an improved environment.

Many awards programs engage a wider public. The Pritzker Prize reached a crescendo with a glittering presentation at the White House earlier this year. The AIA's Accent on Architecture program reaches out to clients, government officials, and public users. On November 5 in New York City, Business Week *and* ARCHITECTURAL RECORD *magazines, in association with the AIA, awarded projects that highlight the architect/client relationship.*

Some awards programs build value systems into their bones. The Aga Khan Award, which Robert Campbell writes about in this issue, eschews glamour for meaning on a global scale. In addition to advancing the state of design in Islamic societies, the international program, which awards prizes every three years, seeks out projects that contribute to sustainability, community development, and cultural preservation. Perhaps its most enviable characteristic is that a professional visits the projects long after completion to assess their construction and programmatic effectiveness over time.

Good awards programs like the Aga Khan are multidimensional, offering insight, through the choices juries make and how the juries articulate their reasons, into why projects are important and how they succeed. Creative programs probe into methods and means, economy, relationship to place, history, and culture.

What could improve the current state of affairs? A brief wish list, drawn from successful programs, follows:

Diverse juries that include clients and users as well as architects. It is amazing and humbling to hear other points of view.

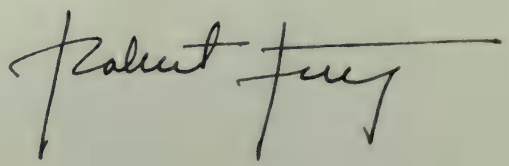
The requirement that at least one juror visit every project, even in local competitions, to determine finalist status. Nothing—even three-dimensional graphics—substitutes for real-life experience.

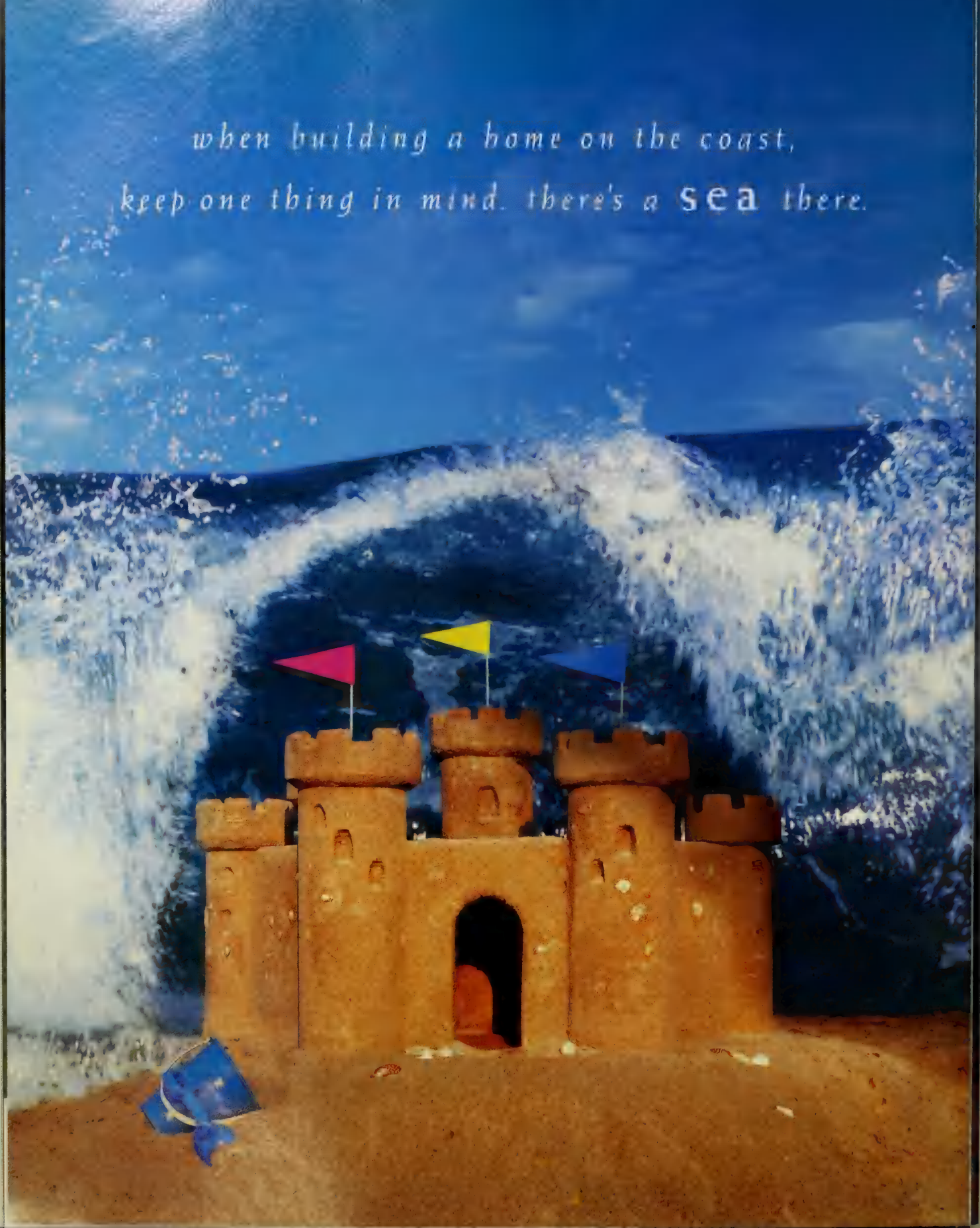
Adequate time for deliberation. Jurors often must confront a large number of entries and rush to judgment.

An awards ceremony that recognizes the client and other key members of the team as well as the architect. No project arises in a vacuum.

Clear criteria and qualified jurists to judge urban planning, historic preservation, and interiors.

Ultimately, awards programs help to define the architectural agenda. The awards themselves are like snapshots, carefully considered or taken at random, hoarded for ourselves or widely disseminated. At their best, the projects we acknowledge set a vision, making friends for architecture, engaging clients, and raising our professional standards. A well-considered program makes dressing up worth the effort.




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LETTERS

Out of touch

Regarding Robert Ivy's editorial in the September issue [page 15], it is disturbing and inconceivable that "the relation of constructed space to human experience" is something architects, or social scientists for that matter, would have to be reminded of. That this relationship can be thought of as a fad that merely comes in and out of vogue explains a lot about our society—none of it good.

Our architecture schools' curricula should make it so that it becomes impossible to build what we call architecture without such a basic understanding of space.

—Gail Satler, Associate Professor of Sociology
New College of Hofstra
Hempstead, N.Y.

Zoning not that zany

I recently read responses to your September Pulse question regarding zoning [page 24]. While I agree that many current zoning laws are outdated and even inappropriate, I was shocked to see that someone educated enough to become an architect would suggest eliminating zoning altogether. Does Nathan Isley, AIA, not realize that without zoning he could wake up one day and find his home nestled quietly between a paint factory and an adult book store?

—Martin Jaster
via E-mail

ER architect defends design

The only negative reaction to the emergency room at North Oakland Medical Centers [News, July, page 40] that I know about appeared in the letter from an architect of sports facilities [Letters, September, page 18].

The comments we hear from staff and visitors alike are favorable and even commendatory. A local newspaper quoted the health-care professional who runs the place, who said, "It doesn't look like a waiting room anymore. It's no longer formal or sterile, and patients tend to feel more comfortable in that environment. Our waiting room used to be the typical square with seats surrounding it; now it's quite spacious, even though it's the same square footage."

With the same sense of humility expressed by the letter-writing critic, let me proffer two beliefs of my own. Everybody is entitled to an opinion. But an architect should have some imagination.

—Harvey Levine, AIA
Gunn Levine Associates
Detroit, Mich.

Everywhere walls are crumbling

I recently returned from Paris and read with interest your articles "Flawed Design and Falling Bricks" and "The Cartier's Troubles" [News, August, pages 41, 51]. These articles brought to mind the Bastille Opera, where the walls are covered with cargo netting and the exterior columns are bending severely. Have I missed something in the architectural press about this landmark building, still relatively new, suffering structural problems, or are these problems just not being publicized?

—Richard Bryant, AIA
WBGS Architecture & Planning
Eugene, Oreg.

Hungarian fears seconded

In response to your September News story about Hungary [page 58], I have been building and project managing in Hungary for over eight years. I have had the privilege of working with a series of Hungarian architects, including Josef Finta, who work hard to create a modern extension of the famous Budapest eclectic style. When one sees some of the bland structures imposed by foreign investors, one can understand the outcry of local architects.

Construction, meanwhile, is not as expensive as suggested in the story. Last year, HUF 100 million equaled about $600,000, not $950,000, the minimum cost stated in the story for 27 percent of the newly constructed single-family homes in Hungary. Where are these palaces, anyway? Construction costs are $45–65 per square foot and land in downtown Budapest costs $20–40 per square foot.

—S. C. Schiff, PE
Paris, France

Credits/corrections

The Design Center Linz, which appears on page 131 of the August issue, was a finalist in the 1995 DuPont Benedictus Awards.

The September news item about the Torre Mayor (page 51) incorrectly states that Eberhard Zeidler designed more than one building on Mexico City's Paseo de la Reforma. Also, the correct spelling of the name of the story's author is Miquel Adrià.

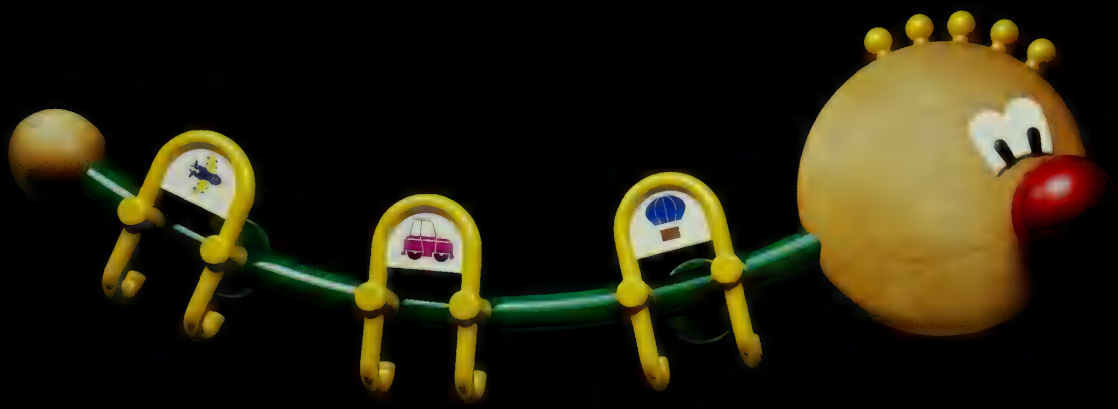
In the August coverage of the Kiasma Museum of Contemporary Art, a photo of the central atrium, in the bottom right corner of page 92, was printed in reverse. ■

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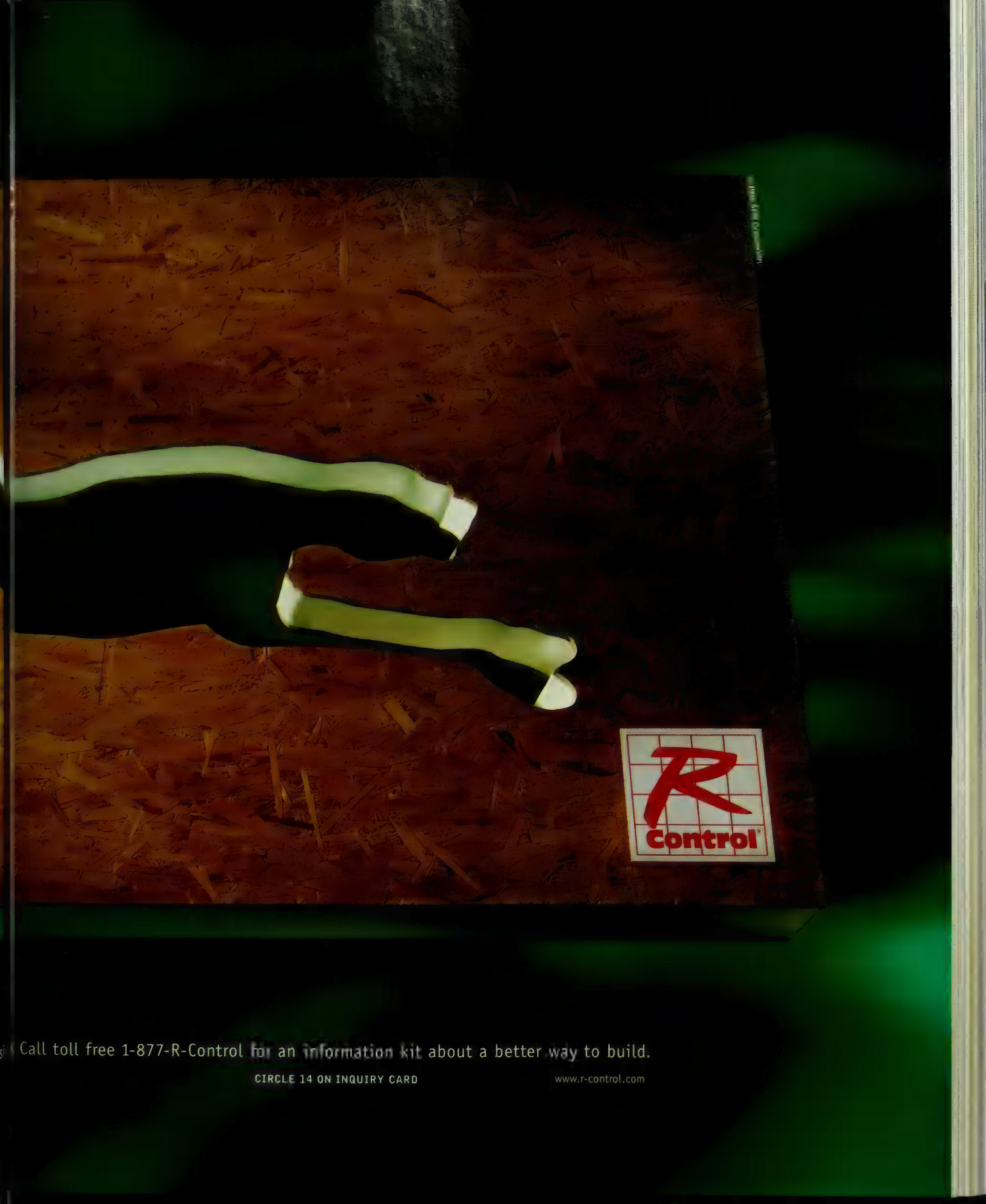
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SPEAK OUT

A lawyer finds that architects, in their intense pursuit of ethics, often deny themselves a pragmatic practice.

AVA J. ABRAMOWITZ

Ava J. Abramowitz, Hon. AIA, is a management consultant who works with design professionals to create profitable practices. Formerly deputy general counsel of the AIA, she is now the public member of the National Architectural Accrediting Board.



In 1985, when I joined the AIA as deputy general counsel, one of the attributes of architects that I found to be both admirable and enticing was their total, unquestioning commitment to ethics. That commitment is one of the reasons why the public ranks architects highly. A strong sense of ethics has made architecture a well-respected profession.

That respect is well earned. But as I've interacted with scores of architects, I've often wondered: Is the way many in the profession interpret ethics also an obstacle? Does their ethical commitment sometimes represent too rigid a thought process, one that can actually isolate the architect, inhibiting the profession's contribution to society and the architect's personal success?

The question has been long in coming. For me, it surfaced most visibly in 1992 at the AIA/ACSA's Summer Institute in Santa Fe, where the dean of St. John's College introduced us to Aristotle's concept of the ethical man. To Aristotle, the idea, the act, and the result had to be individually ethical for the man as a whole to be ethical.

Interestingly, not one of the architects in the seminar could separate architecture into Aristotle's three components. For them, the ideas, the design processes they implemented, and the resulting buildings they created were one entity: a reflection of themselves, their essence.

If all went as planned, they felt they had been ethical. If things happened that compromised any of the three components, they did not want their name on the building. What had occurred was unethical.

At best, a specialized language was at work that comfortably grouped the architects together in a common view of society. At worst, the architects were sharing an insular view of the world that excluded nonarchitects—*including their own clients.* The building was the architect's.

A good client was one who recognized this fact and worked to achieve the architect's design goals. A bad client was one who did not. An architect could, however, transform a bad client into a good client by educating him or her.

The point was reinforced at this year's Summer Institute. One participant declared it unethical to design a building that was not sustainable—a "green" building. I asked, why "unethical"? Why not just bad business for the client in the long run? The architect answered that sustainability was not a decision for the client to make; the architect's pledge to society's health, safety, and welfare made sustainability a necessity.

I was blown away. Did the problem rest with the words "good business"? Perhaps the speaker lacked the business know-how or the words to convince a client that green design makes good, economic sense over the life cycle of the building, or that these days good business encompasses far more than mere dollars and cents.

Perhaps a bit of both were true, but it was really irrelevant, because the architect, by labeling the decision as ethical, had taken the decision upon himself. He did not need to be able to communicate his point of view or to provoke discussion. Not having a sustainable design was not an option. Anybody who challenged him on it was either unethical or in need of education, even if the challenger was the client himself.

I then had to ask myself: Do ethics appeal to architects because the concept puts them on the side of the good? Or do ethics appeal because their invocation helps insulate architects from the hard decisions forced on them by a world not of their design? Could it be that, rather than submit to the rough and tumble of society and the free marketplace, architects hide behind their ethics?

Just review the history of the AIA's Code of Ethics. Architects did not want to compete for commissions? They made supplantation unethical. Architects had trouble getting paid for their services? They declared free services unethical. Architects did not want to competitively bid? They made that unethical as well.

One could conclude that architects were basically clear-cutting their own land. After all, it was architects who banned architects working as developers and architects as design/builders. The consequences were enormous: while the profession argued about ethics, the developers and design/builders of the world built themselves into center position.

A shared view of ethical premises is a good thing in many ways. It facilitates inter-architect decision

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making. It makes inter-architect communication faster, and it has produced a profession that is highly esteemed by the public and is rightly proud of its dedication to service and to the health of communities.

But it also appears that an inward-looking definition of ethics actually works to separate and insulate architects. It may also help foster the perception that architects march to their own drummer, regardless of client hopes and aspirations. And it may be a major factor in causing people to perceive the profession as arrogant.

It could even be that the result of that definition of ethics—because it fosters an unquestioning belief in the rightness of what an architect is doing—shortchanges client considerations. This gives credence to clients' oft-repeated complaint that architects don't listen. Could it be that architects' interpretation of ethics also gets in the way of listening and responding to client needs and ideas?

I have two suggestions for architects who are equally committed to ethics and to healthy client relationships.

First, when faced with a design or practice dilemma you would normally label unethical, force yourself to think through the dilemma first from your client's perspective—and only later from your own.

What are the short- and long-term implications of each available option (both positive and negative) for the client? Are there any risk-management implications for the client? Any legal implications? Any other business implications? How can you, as the client's consultant, help him or her through those options so that a sound decision can be reached? Then, and only after you have forced yourself to confront and work through the client's issues, should you deal with your own.

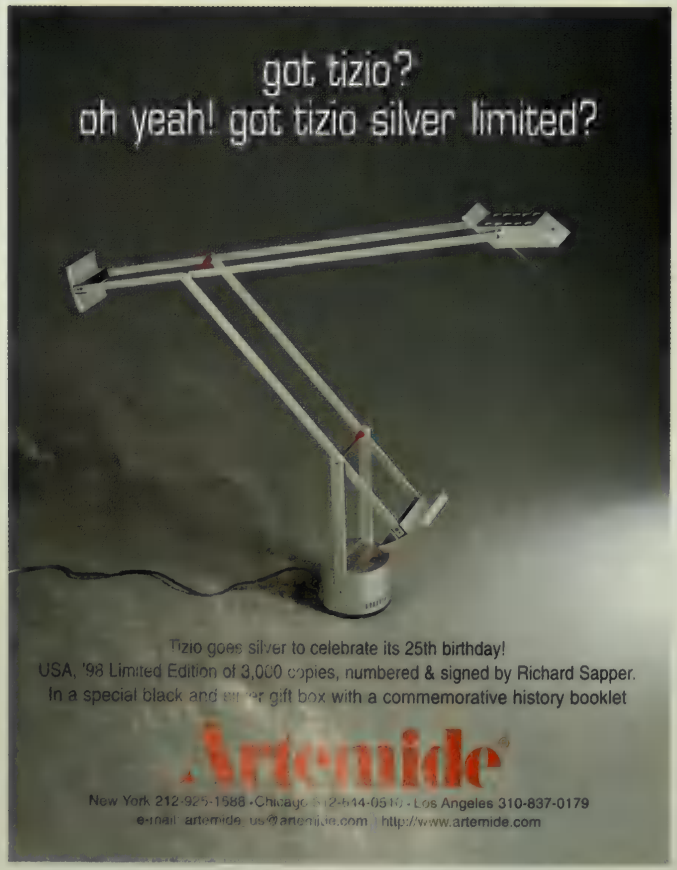
Second, consider believing and acting as if, all things being equal and legal, the building belongs to the client first, to society second, and to you last (if at all). I know this may be an extremely tough concept for many readers. After all, licensing law and the AIA's Code of Ethics talk of the architect's obligations to society as much as they address the architect's obligation to the people who pay them for service.

But society doesn't hire you. People do. And these people expect you to hold their requirements and needs (as long as they are legal) paramount while you serve them. If you cannot put the client first—for whatever reasons, including ethical ones—that client is not a client for you, nor are you the architect for that client.

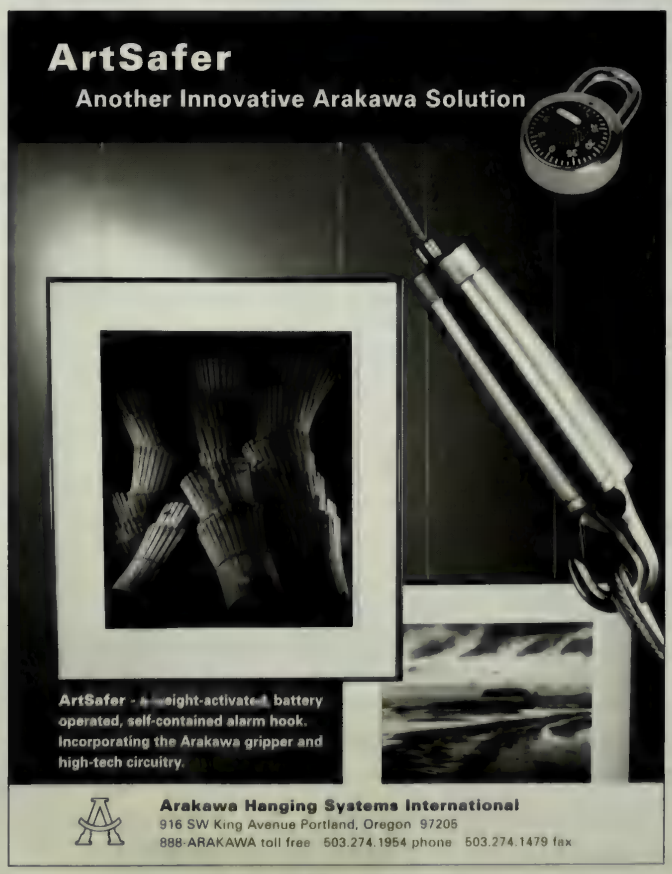
There are other practical reasons to keep the client at the forefront of your thinking. Risk management is founded on it. (Remember Risk Management 101? The architect makes recommendations. The client makes decisions.) Client satisfaction, repeat business, sound referrals, and paid invoices depend on it. Design excellence also springs from it. Numerous star architects and award winners have found that great architecture comes about only when good clients and good architects work together to accomplish the client's goals.

In this way, realistic ethics can become the springboard for service and the source of communication that will bring architects and architecture successfully into the public realm. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk if possible) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*



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MENTORS An African-American female architect describes the many challenges faced by minority women considering the field.

Patricia E. Harris, AIA, is owner of New Synergy Inc., an architecture and design firm in Durham, North Carolina. She earned a master's degree in architecture in 1986 from the Massachusetts Institute of Technology.



As one of 99 licensed female African-American architects in the United States, I'm often asked what I would say to young black women who are considering the profession. As a caveat, I should first say that the African-American community is not a monolith; my perspective may not be applicable to everyone. However, I have had experiences that are germane to the challenges faced by minority professionals in general and African-Americans in particular.

At the core of an architect's abilities is the skill to create something entirely new from existing references. This may seem obvious, but when it is applied to a group such as African-Americans—who historically have not had visible role models within the profession—the ability to apply indirect models and to develop support systems, mentors, and goals is of dire importance. Minorities need extra mental preparedness to work within the dominant culture. Seek out guides and references you can relate to.

In my experience, any African-American approaching the journey of becoming an architect must expect that models for design archetypes and professional achievement will be based mainly on Eurocentric history, theory, and construction methods. Minority students must be prepared for the fact that through much of their education and internship, their own cultural norms and historical figures may be invisible. They must find a way to make their education relevant to their own internal map.

Educational institutions do not have a diverse faculty, mainly because there are still so few minorities (and women) represented in architecture. At MIT, my standard courses were based primarily on European models. If SIGUS (Special Interest Group in Urban Settlements, which focuses on developing nations) had not existed, my graduate education would have barely touched on non-European design.

For a minority student, it is imperative to seek models from one's own experience and history; recognize that diversity strengthens, not threatens, the whole; and understand that being able to work within the parameters of multiple cultures does not require assimilation, only flexibility.

Fortunately, our society is changing and there are more diverse role models to explore. We all know of notable African-American male architects, such as Paul Revere Williams and Julian Abele. But how many can name a female African-American architect? I would encourage young black women to look for us. We can be found; try the AIA, which has a commitment to diversity. Also, Dennis Mann, a professor of architecture at the University of Cincinnati, has published a directory of African-American architects.

I recommend that any African-American undertaking the journey realize it is just that—a journey—and that real challenges are part of any process as exacting as architecture. Young black architects will meet social challenges, because their presence in the firm and at the construction site may pose a threat to some whose paradigm does not include African-Americans as architects. They may be viewed as tokens who are present only to meet some quota, rather than as people with skills equal to those of their peers. For these reasons, it is crucial that the minority architect maintain a strong sense of self-respect and determination.

Architecture demands focus, persistence, and perseverance to survive the eight-year trek to licensing. Furthermore, ours is not a profession of great visibility, nor can one expect to garner the same income as a doctor or attorney—professions highly encouraged in the African-American community.

If you have no intrinsic drive or hunger for architecture, I suggest you try a more suitable field. There is limited monetary compensation for the years of intense effort that are required to become licensed.

However, if making a contribution to an environment of beauty and functionality is an inspiration, if giving yourself over to a muse that makes time stand still during hours of creative exploration causes the voice inside you to say "yes!" then I say: You go, girl! ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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PULSE RECORD readers were asked: What do you think of the Guggenheim Museum Bilbao?

Most Post-Modernists seem to have veered so far from any design philosophy and any relationship to function that they exist only for the shock value they impart to their viewers and, more notably, to the architecture critics who sing their praises. Gehry is at the head of the class in this respect.
—Keith Haag, FAIA
Cuyahoga Falls, Ohio

Be it a fish, a ship, or a blossoming flower, it is absolutely inspiring. Around every corner, there is a breathtaking composition of organic form.
—Brent Medsker
Edmonds, Wash.

At the Guggenheim Museum in New York, curved and angled walls and sloping floor lines resulted inevitably from the space and the display technique within. Concrete as a building material was chosen as vital to the building's concept. None of this can be said of the forms or materials of the Guggenheim in Bilbao. There the result is not architecture, the art of building well, but an arbitrary display of form.
—Rem Huygens, FAIA
Wayland, Mass.

I've been there. It's exciting. I felt the energy. It ties elements of the environment together and creates a whole new dynamic for the place. It meets all the objectives. It shows how architecture can mobilize. The design, the use of materials, and the response to topography and urban zones make it the building of the century.
—Merritt Sher
Larkspur, Calif.

It's the greatest fraud of the 20th century. Man should create order out of chaos, not chaos out of order.
—Robert J. Burman, AIA
Glendale, Calif.



Fish 'n' Chips in Bilbao **by Anatol Zukerman, AIA, Newton, Mass.**

I am a young architecture school graduate with aspirations of becoming licensed, and Gehry's museum provides me with proof that there is more out there than the "cookie-cutter" architecture I have mainly been exposed to so far in my career. Rarely do I get the sense of individuality that the Guggenheim invokes, since most of the time we are limited by functionality, cost, and convention.
—Kimberly S. Bondi
Orland Park, Ill.

Frank Gehry is basically an abstract artist—he could be a great one—but he is not an engineer, as Eero Saarinen, Felix Candela, Frank Lloyd Wright, and even Alexander Calder were. There is no clear engineering principle expressed in the free-form Bilbao museum. Whereas Saarinen's TWA Terminal, for example, is a clear expression of the properties of structural thin-shell concrete, the sculptural forms in the Guggenheim Museum are put together by steel armatures, computerized.
—George W. Sinnott, AIA
Oakland, Calif.

This Month's Question

Who is the world's greatest living architect, and why?

We use a host of different criteria when judging architects and their work. We may appreciate how an architect manipulates form, defines a streetscape, considers the environment, respects context, masters materials or building technologies, or just brings projects in on time and on budget. Tell us who your favorite living architect is—but remember that the most interesting part of your answer is why you've chosen this architect.

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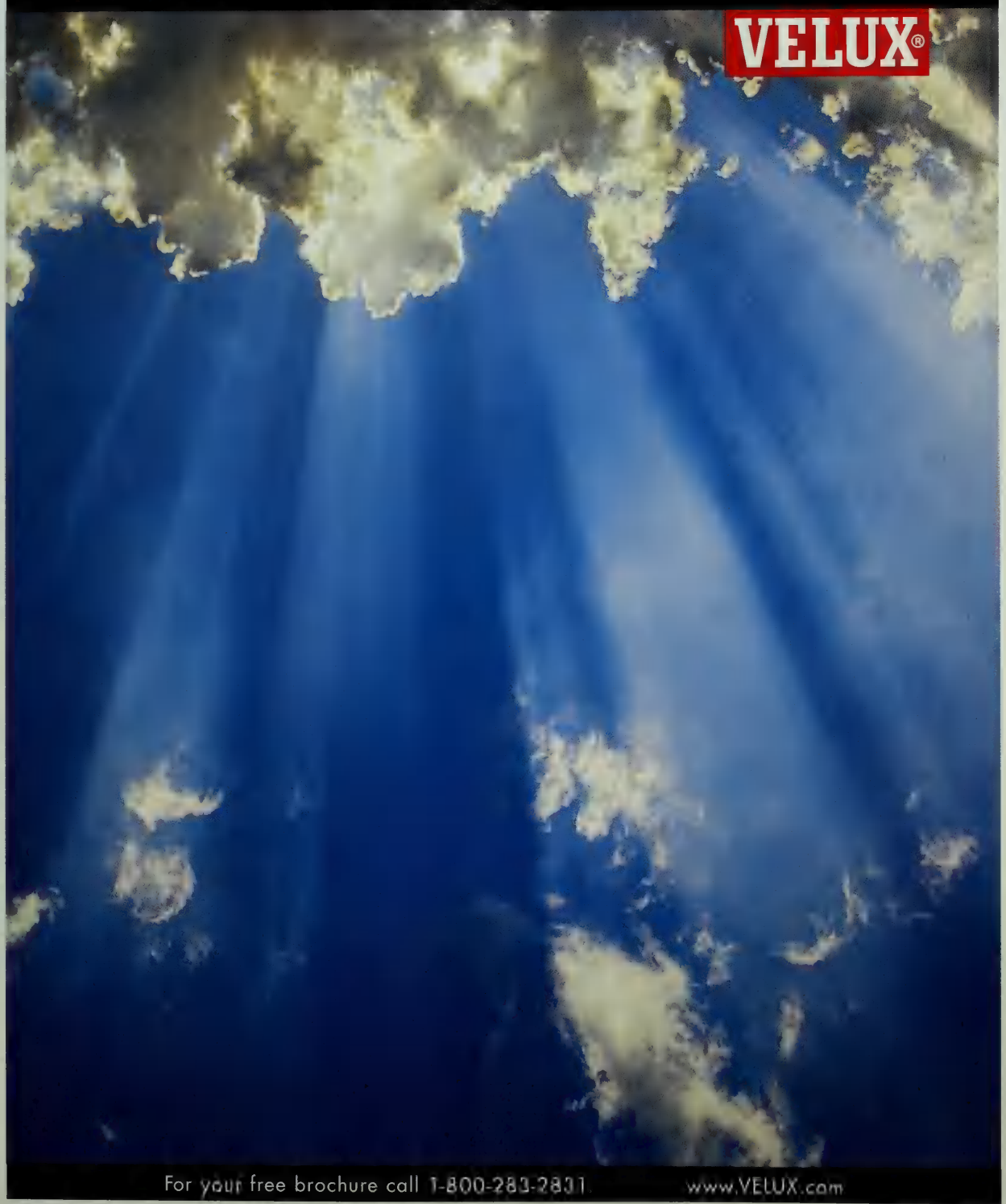
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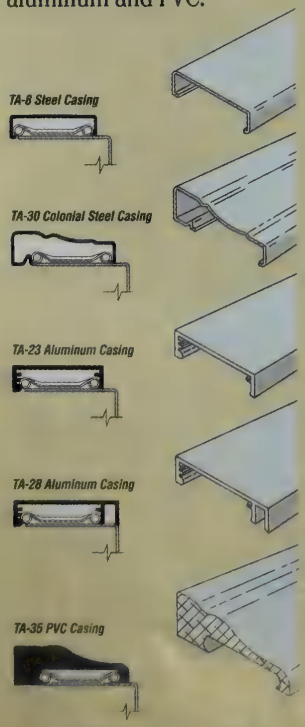
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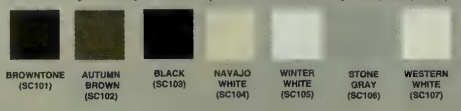


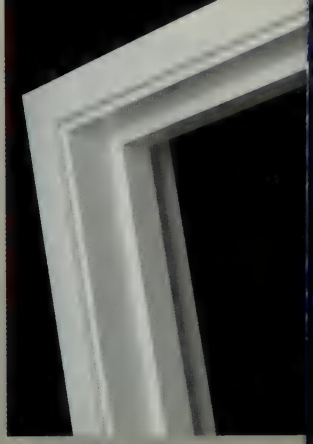
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Interior Design Firm - *Atkinson + Design*
Location - *Canada Life / Toronto - Ontario, Canada*
Project Paint Colors - *Sherwin-Williams ColorAnswers®: Amber Grain SW1348, Wedding White SW1913, Paper Lantern SW1360, Irish Cream SW1115*
Products - *Sherwin-Williams latex and acrylic paint*

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Interior Design Firm - *Baggot & Bak, Ltd.*
Location - *Delaware County Courthouse / Media, Pa.*
Project Paint Colors - *custom colors*
Products - *ProMar® 200 latex flat and semi-gloss*

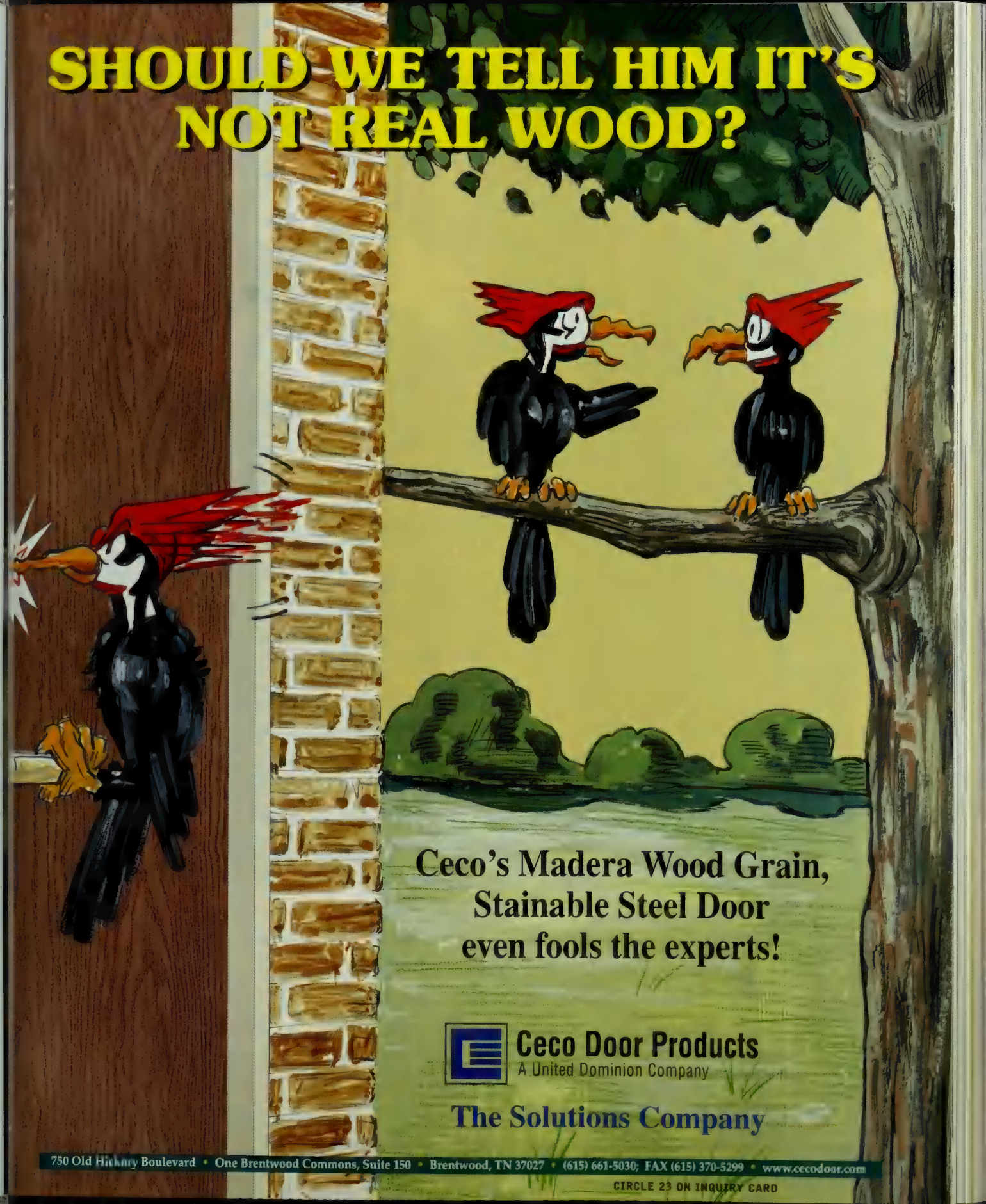
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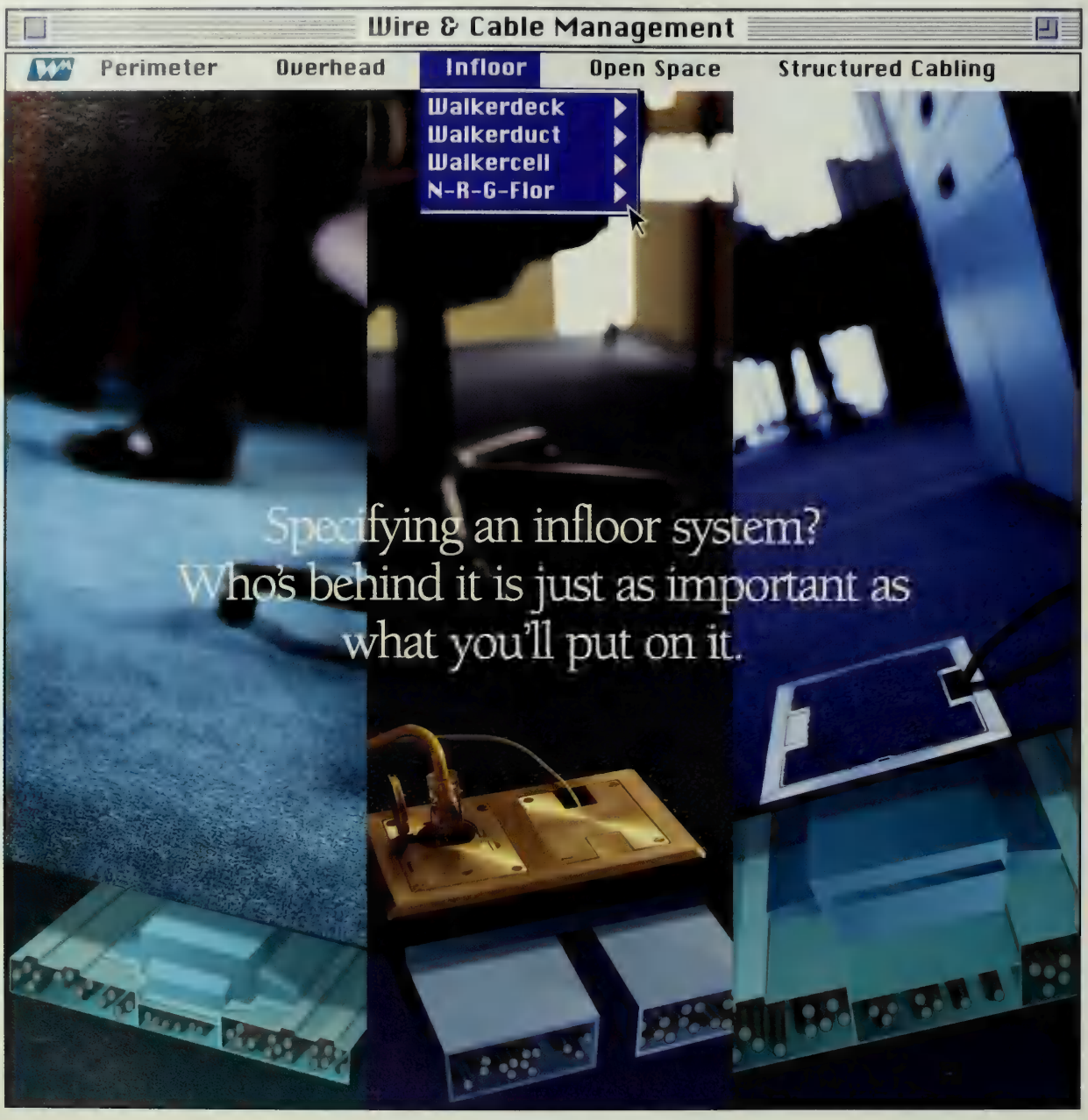
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CIRCLE 24 ON INQUIRY CARD

CORRESPONDENT'S FILE Cincinnati, not thought of as a hotbed of design, has been building a portfolio of work by world-famous architects.

BY SUSAN R. BLEZNICK

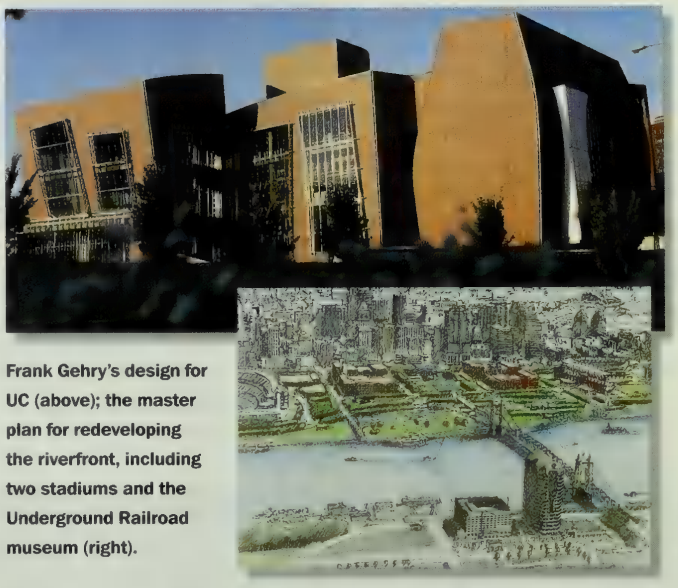
Susan R. Bleznick, a former editor at RECORD, writes about the arts for magazines and television productions. She lives in Toledo, Ohio.

In 1993 the *Places Rated Almanac* picked Cincinnati as America's "most livable" city. It still ranks near the top today, with high scores for job opportunities, recreation, and the arts. The almanac does not include architecture as a factor in the selection process—but if it did, Cincinnati might garner an even higher ranking.

In the last decade or so, designs by some of the world's best-known architects have been popping up in Cincinnati in numbers unusual for a mid-size, heartland city. Michael Graves inaugurated the trend when he designed Riverbend Music Center, an outdoor concert venue that opened in 1984. Now, signature architecture projects are the rule rather than the exception. And as the new buildings take shape, the city's reputation for being conservative may be shifting. While some of the designs have generated controversy, there seems to be a willingness among citizens and politicians to support experimentation, at least in terms of design.

Cesar Pelli's design for the $82 million Aronoff Center for the Arts in downtown Cincinnati is one striking new addition to the cityscape. The center's brick, glass, and steel structure forms a dramatic backdrop for theater, ballet, and other performances.

The three-year-old Aronoff Center is about to be joined by a new neighbor, the Contemporary Arts Center (CAC). This month, the center plans to reveal Zaha Hadid's long-awaited final design for its home (RECORD, April 1998, page 35). In a recent story in the *New York Times*, Herbert Muschamp called the CAC the most important new building downtown and a "breakthrough" design. CAC director Charles Desmarais says the 10-level museum will resemble a three-dimensional jigsaw puzzle that symbolizes innovation and diversity.



Frank Gehry's design for UC (above); the master plan for redeveloping the riverfront, including two stadiums and the Underground Railroad museum (right).

While the downtown area is home to many of the new projects, it is the University of Cincinnati that has the city's most impressive collection of designs. This state university has created a master plan that looks to architecture as a unifying force, and when the plan is completed, works by seven renowned architects will be in walking distance of one another.

Ron Kull, AIA, the university's architect, says the students joke that UC stands for "under construction." Building started eight years ago and will continue for another six years, he says. Along with new structures, the university is creating green spaces, pedestrian paths, and a corridor with commercial and recreational amenities.

Hargreaves Associates of San Francisco began work on the master plan in 1989, at a time when the university lacked both a strong image and a strategy for the growth of its campus, Kull says. The idea of employing major architects was seen as a means to project an image of diversity. "What better way to make a statement about diversity than to look at diverse architects who are at the pinnacle of their careers?" Kull asks. "We were also creating architecture to stimulate intellectual discussion."

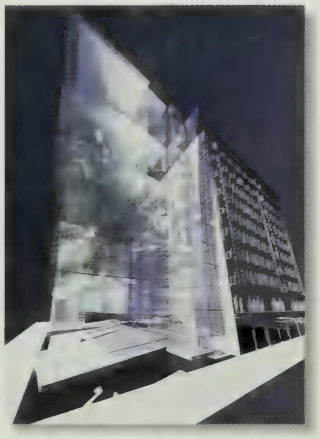
Peter Eisenman's $36 million Aronoff Center for Design and Art, opened in 1996, wraps around UC's College of Design, Architecture, Art, and Planning and is a conversation piece because of its irregular

angles, multicolored exterior, and dynamic use of space. Graves, a UC alumnus, designed the 175,000-square-foot, $36 million Engineering Research Center, opened in 1995. The six-story sandstone and brick building has a prominent site on a main artery of the campus.

UC's Conservatory of Music is in the final phase of a $91 million expansion and renovation that began in 1993. Henry Cobb designed the new, 184,000-square-foot rectilinear building, which will wrap around the existing building. It will most likely be completed next year.

Frank Gehry's design for the $46 million Vontz Center for Molecular Studies is the gatepost for UC's medical school campus. The building's brick exterior puffs out as though it is about to explode. Originally, Gehry had thought about creating flat surfaces, but he later changed his mind; the more he thought about the building, Kull says, the more he wanted it to be daring.

David Childs designed UC's 203,000-square-foot Vera Clement Edwards Center, which opened in 1992. George Hargreaves and Mary Margaret Jones designed the Sigma Sigma Commons, a public space featuring a light tower by Rodolfo Machado.



Along with Kull and UC's administrators, a key player in getting these designs built was Jay Chatterjee, dean of UC's College of Design, Architecture, Art, and Planning. He sits on Cincinnati's design review board and is influential in community decisions.

Another major player has been native Cincinnatian Stanley Aronoff, whose name graces several of the city's new buildings. Most of the recent UC projects were paid for with state funding; Aronoff was president of the Ohio state senate from 1989 to 1996 and chairman of the finance committee on and off in the 1980s.

As at UC, a new master plan is guiding the restructuring of Cincinnati's downtown riverfront, where two stadiums may be built, the new Underground Railroad museum will soon stand, new parks are being constructed, and infrastructure is being improved.

In 1995 the owners of the Cincinnati Bengals alerted the city that the team was in dire financial straits. The Bengals were playing in Riverfront Stadium, built in the early 1970s for Cincinnati Reds and Bengals games. "Our owners desperately wanted to stay here in Cincinnati," says Troy Blackburn, director of stadium development for the Bengals. But other cities were interested in the team, so Hamilton County took action to raise $550 million for two new stadiums—one for baseball, one for football—by putting a half-percent sales-tax increase on the ballot in 1996. Voters passed it.

The tax increase will generate funds to cover the majority of the $280 million construction cost for the Bengals' Paul Brown Stadium. In addition, the Bengals kicked in $50 million and the state contributed $42 million.

NBBJ's Sports and Entertainment division designed the 65,000-seat stadium, a fractured, elliptical shape that opens up to downtown and river views. The project should be completed in 2000.

The tax revenue is also earmarked for a new 45,000-seat stadium for the Reds, although that project is currently in limbo because

PHOTOGRAPHY: © MAURICIO LUZURIAGA (OPPOSITE BOTTOM); CAC RENDERING BY ZAHA HADID; AQUARIUM RENDERING BY HOK/GBBN

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of a political battle. Some city council and community members object to a riverfront site for the stadium; they want it built in the northeast section of downtown, in part to revitalize a historic neighborhood. The city council placed the issue on the November ballot; this month, Cincinnatians will vote on the site.

The Reds prefer the riverfront, where both sports teams have always wanted to be, according to Bob Richardson, AIA, Cincinnati's city architect. In any case, the vote may have no real impact, since the county commissioners have the final say—and they favor a riverfront site. Meanwhile, in September, Hamilton County commissioners selected HOK Sport and GBBN Architects, a Cincinnati firm, to design the stadium.

Regardless of the unanswered stadium questions, the city is moving forward with the downtown and riverfront master plan created by Urban Design Associates, a Pittsburgh firm. "Our whole goal is to reunite the downtown and reconnect the river to downtown," says Richardson. The city is working on a $147 million reconstruction of Fort Washington Way, the highway that acts as a barrier between downtown and the river. Other plans include extending the downtown street grid to the river, creating more parking, and extending the park system.

In September, the National Underground Railroad Freedom Center picked a design team for its 125,000-square-foot riverfront museum: Blackburn Architects of Indianapolis, BOORA Architects of Portland, Oregon, and Martha Schwartz of Cambridge, Massachusetts. A design for the $80 million museum—which will commemorate the Underground Railroad and promote interracial harmony—has not been finalized. Funding is from a mix of private and public sources.

Not to be outdone, the city that sits directly across the Ohio River from Cincinnati—Newport, Kentucky—has undertaken a number of projects of its own. The $40 million, 100,000-square-foot Newport Aquarium is under construction and will open next year, with HOK Sport as design architect and GBBN Architects the architect of record. Two blocks away, plans are under way for the 33-ton World Peace Bell and the adjacent Millennium Tower, which will rise about 1,000 feet—higher than any building in Cincinnati. ■





Zaha Hadid's idea for the Contemporary Arts Center (opposite); the Newport aquarium (above); and Rodolfo Machado's light tower in UC's Sigma Sigma Commons (left).

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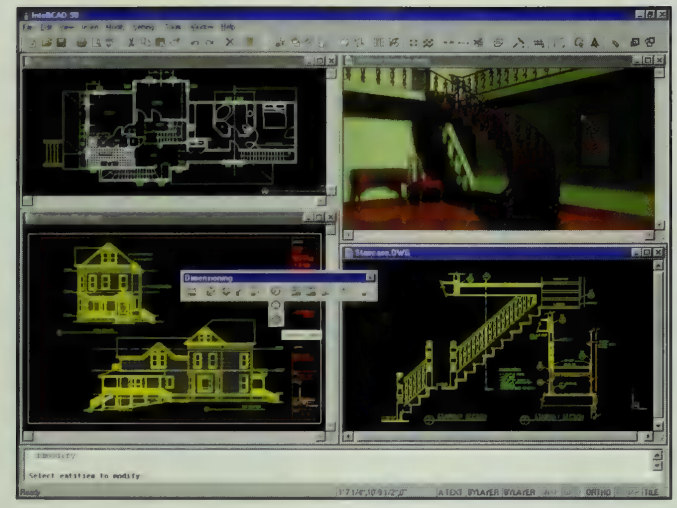
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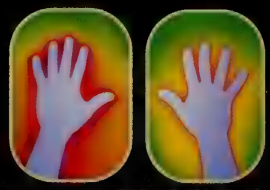
CIRCLE 26 ON INQUIRY CARD

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CIRCLE 27 ON INQUIRY CARD

TALLEST OFFICE TOWER IN MUNICH TO BE BUILT WITH SUSTAINABLE DESIGN

IOKP, a successful "green" architecture firm based in Düsseldorf, Germany, has received the go-ahead to design an immense, ecologically minded tower in Munich.

After five years of discussing how best to develop the city's industrial north side, with competition designs ranging from glass pyramids to twin towers, Munich's municipal committee has approved plans for the 656-foot-tall tower to be built next to Munich's beltway.

The new tower, which will be the city's tallest office building, will complete a visual triad, along with the Olympia TV tower—at 950 feet, Munich's tallest structure—and BMW's 330-foot corporate headquarters shaped like a four-cylinder engine.

IOKP's building, intended to house part of Munich's burgeoning media and computer industry, will comprise three sections of 12 to 15 floors each, crowned with a smaller top zone. Each tower segment will hang from a central structural core, freeing the exterior to work as a porous first skin, which the architects will wrap with another glass membrane.

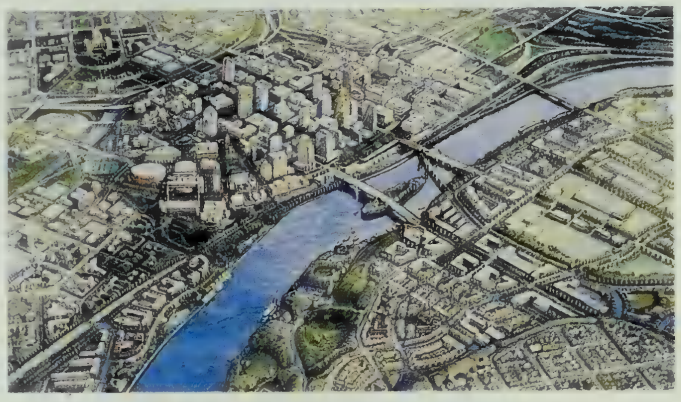


This exoskeleton will block wind and noise and provide space for the installation of sun louvers in the almost three-foot gap between the two surfaces. More important, this narrow vertical space will also give inhabitants climate control independent of air-conditioning systems: corresponding "window" openings on both exteriors will permit those inside the building, even on top floors, to let in fresh air.

"This building will really breathe," says architect Christoph Ingenhoven. "Considering that the '60s skyscraper, with its sealed-in atmosphere, is still very much the standard today, the principle of a breathing high-rise is an important step forward." The relative structural freedom of the exterior allows sun to enter, allowing for the installation of extensive winter gardens—meaning that the tower "will breathe from the inside out," notes Ingenhoven.

IOKP projects energy savings of up to 40 percent (compared to traditional skyscrapers), as already demonstrated in Germany's first ecological skyscraper, the Rhein-Westfalen Electricity Works Headquarters in Essen, which the firm completed in 1996.

Munich could profit from IOKP's innovative engineering in more ways than one. City officials hope the new building will have the same impact as Günter Behnisch's tent-like, suspension-cabled sports complex built for the 1972 Olympics and help to create an image for Munich as a world leader in progressive design. *Claudine Weber-Hof*



MINNESOTA'S TWIN CITIES NAVIGATE A RETURN TO THEIR RIVER ROOTS

The Mississippi River defined both Minneapolis and St. Paul. Minneapolis grew around the St. Anthony Falls power source; St. Paul came to prominence as the waterway's last navigable port. But as milling and transportation declined, so did the Mississippi's importance.

Now, after decades of neglect, Twin Citians are reevaluating the role of the river. Government and private initiatives, along with public charrettes, have produced ideas to highlight the Mississippi's natural attributes and the cities' unique riverfront districts. The common goal is to link the downtowns with the river, and in the process to create multiple opportunities through mixed-use projects.

Cass Gilbert, who was from St. Paul, wanted his hometown to be a ceremonial, processional city, but his designs were compromised by highway construction and short-sighted planning. In 1992, architect Benjamin Thompson offered a plan to return to Gilbert's idealism by building a "Great River Park"; the city was then inspired to team with Toronto-based urban planner Ken Greenberg to create the St. Paul on the Mississippi Development Framework, which they finished in 1997.

The Framework (plan shown above) outlines a process to foster new connections between river and city. It is already guiding development, as indicated by major projects under way; for instance, Ellerbe Becket's Science Museum of Minnesota and its outdoor spaces will act as a hinge between downtown and the river. The RiverCentre convention complex and a proposed hockey arena by HOK have similar purposes.

In contrast to St. Paul's emphasis on the overarching whole, Minneapolis's efforts center on appropriate infill and infrastructure development. Urban Design Associates of Pittsburgh planned the West Side Mill District, a half-mile stretch of shore just north of downtown. Using "fingers of green"—corridors that reach from the river to downtown—alongside infill construction, UDA's plan helps weave the district into the urban fabric. Other key elements include integrating light-rail transit, as well as possibly building a baseball stadium.

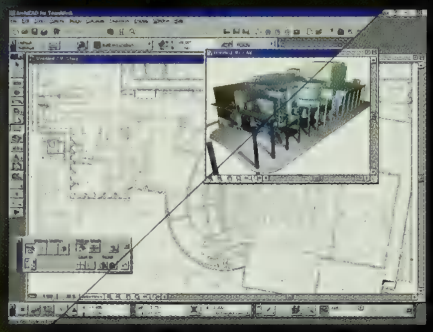
A proposed history center, designed by MS&R, will be wrapped in the shell of an old mill. In addition, Shea Architects is renovating the derelict Milwaukee train depot as part of a hotel complex. The projects are spurring development in adjacent areas; housing projects in the Warehouse Riverfront District, bordering the Mill District, have proven extremely popular. In response, local firm Cuningham Group created guidelines for development to complement the demand.

Recent designation of the Upper Mississippi as an American Heritage River has given residents even more impetus in their bid for reconnection. *Todd Willmert*

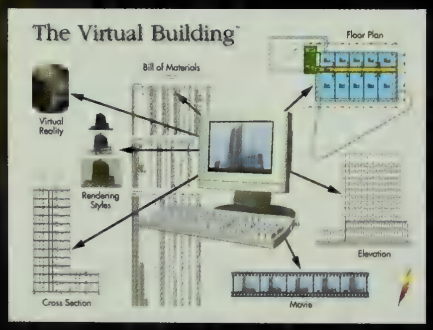
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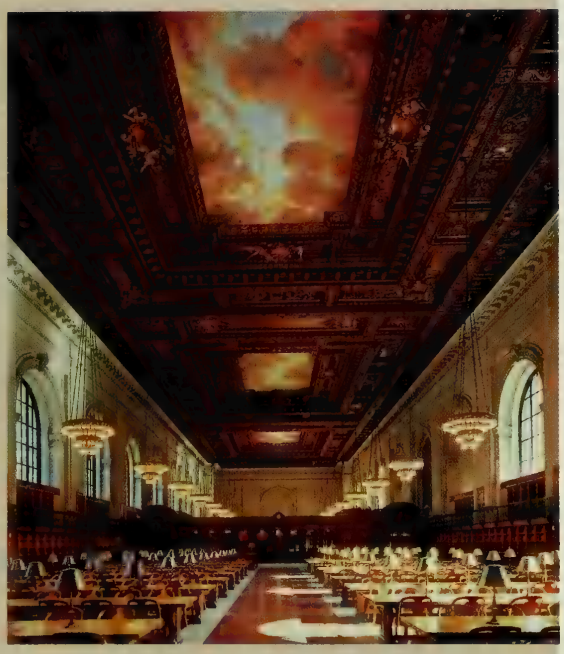
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A READING ROOM'S REVIVAL These are proud days for New York's institutions. Grand Central Terminal was recently rededicated amid much hoopla. The news that Penn Station will be moving across the street to the stately General Post Office building was met with enthusiasm. And on November 16, the New York Public Library will reopen the doors to its main reading room, which has been painstakingly restored to its former glory.

The library contracted New York's Davis Brody Bond LLP to oversee the restoration, which necessitated closing the room for the last year and a half. When the architects—led by founding partner Lewis Davis, FAIA—arrived, they were faced with windows that had been painted black during World War II because of air raids; faded ceiling murals; an unsightly copy service center; and other factors that obscured the original design by Carrère and Hastings.

The firm stripped away the grime and decorating mistakes that had accumulated since the library was built in 1911, and then updated the electronic infrastructure to enable the easy use of modern technology, including Internet access via jacks on most tables. Intricate woodwork throughout the football-field-long room was stripped and stained, plaster was cleaned and painted, and copying and other services were moved to other parts of the building. Daylight was allowed in through new windows, and even the lampshades were returned to their original deep gold (they had been painted green). Along with the modern electronics, subtle architectural touches were added, such as installing recessed lighting to illuminate the blue skies of the ceiling murals.

The project was funded by a $15 million gift from Sandra Priest Rose and Frederick P. Rose; the room will be renamed in honor of their children. *Soren Larson*



GLASGOW PREPARES A YEAR OF DESIGN

After winning a competition to be named the "U.K. City of Architecture and Design" in 1999, Glasgow, Scotland, has embarked on a series of projects intended to boost the image for the city as a center of creativity—and to generate tourism, of course.

The program, an initiative by the Arts Council of Great Britain, will revolve around the reincarnation of the Glasgow Herald Building—designed by the city's most famous architect, Charles Rennie Mackintosh—as the Lighthouse, Scotland's Centre for Architecture, Design & The City (right). Due to reopen in May, the building will house offices, exhibitions, and educational facilities. Glaswegians won't have to wait until May, however: programs begin in January.

Among the more highly anticipated events is Homes for the Future, a six-month expo where experimental designs will be built on the Glasgow Green as the starting point for a new community nearby. Working on a total investment of $15 million from public and private sources, an international crew of



architects is designing projects with the intention of finding new methods to deal with the challenges of urban living.

Among other activities are the international festival, in October, and the Modern Masters exhibition series, which will highlight the works of great architects such as Mies van der Rohe and Alvar Aalto.

Glasgow wants to ensure that attendance is high during its big year: the vast majority of the exhibitions and events will have free admission. *S.L.*

CALLS FOR UPDATING AND BUILDING AT NATIONAL SYMPOSIUM ON SCHOOLS

Soaring student populations and a decaying infrastructure have combined to cause what AIA President Michael Stanton calls "the double whammy of unprecedented need and a rapidly aging stock of schools."

Stanton was interviewed at the National Symposium on School Design: Schools as Centers of Community, held on October 8 in Washington, D.C. The event was hosted by the Department of Education and the White House Millennium Council, with support from the AIA; other forums were held concurrently in 12 cities across the country.

School enrollment across the U.S. is at an all-time high, it was noted, with numbers not seen since the postwar baby boom. Additionally, with a life expectancy of 50 to 60 years, the stock of schools built to accommodate the previous hordes is nearing the end of its usefulness.

Add to this the expanding role of the school as a focus for the community, and it becomes clear that school design should be a national priority.

Many schools now have multiple duties as centers for day care, language and job training, immigrant services, and senior citizen programs. Secretary of Education William Riley noted that schools "should be a place that students parents, teachers, and local residents are proud to share with one another."

The White House issued a statement outlining a plan of action calling for the modernization of old schools and building of new ones, encouraged by a proposed interest-free bonding authority; keeping public schools open longer in the year and investing in after-school programs; and expanding the role of schools in the community through programs for all ages and incomes.

The White House also suggested convening regional meetings across the country, spearheaded by the Department of Education, to discuss how schools can meet local challenges; and promoting energy-smart schools to lower energy costs and redirect those savings into school programs. *Ellen Sands*



GRAPHISOFT'S NEW OFFICES EMERGE ON HISTORY-LADEN BUDAPEST SITE

A stroll across the grounds of Graphisoft Park in Budapest is a walk through time. Located on the banks of the Danube River, Graphisoft's high-technology software research and development center, now being constructed, is surrounded by history—a fact not lost on its architects.

"There's a timelessness to this site," says Ferenc Csagoly, managing director of Epitesz Studio, who with Epitesz's senior architect, Ferenc Keller, designed the complex. The firm won the commission three years ago.

Graphisoft Park sits on about 18 acres in a section of the city called Aquincum, named by the first-century Romans who once occupied the area. Not far away are a large amphitheater dating from AD 160 and the remains of a villa, a chapel, and baths. "There were no basements dug for the buildings at Graphisoft Park because it's an archaeological site. They were erected on slabs," says Csagoly.

There are now three buildings in the park—including Graphisoft's newly opened 33,000-square-foot headquarters—which have cost a total of $10 million. Plans call for seven to 12 more buildings, and construction will take approximately five more years.

"We designed the buildings based on a very detailed program of what the buildings would be used for and how [employees] do their jobs," Csagoly says. "We spent a lot of time working with Graphisoft and learning what software development means. They gave us a free hand to be creative. It was a very pleasant situation."

The complex, he noted, was designed using Graphisoft's ArchiCAD visualization tools. Each of the three-story structures features a number of small balconies, a lot of interior open space, and integral communications, computer, and security systems. The landscaped campus, with small hills and trees, will eventually have a stream flowing through it.

"We used a lot of transparent and opaque glass to give the buildings a sense of openness," Csagoly says. "[It's] a bit similar to early-20th-century architecture, when modern movements like Bauhaus started."

Standing nearby is the former Budapest gasworks plant, built around the turn of the century, which features strange spires that conjure an illustration out of a book of fairy tales. Graphisoft is considering converting the building, vacant for more than 20 years, into an industrial museum, but Csagoly says it would be a formidable, expensive task.

"The towers are very beautiful, but the interior walls are impregnated with coal dust and tar, so it would be very hard to renovate them," he explains. *Carl Kovac*

DESIGNS THAT HUG THE TREES: THE FOREST CANOPY STUDY CENTER

In the interest of gaining a new perspective on forests, Anderson Anderson Architecture of Seattle is working with ecologist Nalini Nadkarni to develop the Forest Canopy Study Center on the campus of Evergreen State College in Olympia, Washington.

At the center, students, faculty, and visitors will wind their way along a 1,500-foot-long ramp that rises 80 feet above the ground into the treetops before burrowing 10 feet underground for a mole's-eye view.

Explains Nadkarni, a faculty member, "Creating a canopy network to view the forest from a variety of vantage points is the first step in understanding, appreciating, and managing forest ecosystems."

The Anderson brothers, Peter and Mark, plan to build a welded aluminum and wood ramp supported by tube steel stilts splayed —for stability—on a zigzag course through the forest. Trellis screens attached at various points to an expanded aluminum guard rail will provide spots for moss and lichen; rubber tubes will carry steam from the university's central plant along the ramp to create mist for the growth. If fundraising proceeds on schedule, construction could begin in 2000.

This fully accessible walkway system will be entered from the third floor of the existing college library and will be punctuated by a series of platforms for scientific experiments, instruction, and public viewing. Each of the interpretive decks throughout the project will feature a hydraulic extending crane, to be used for flexible access to research projects deep within the forest canopy. A 2,500-square-foot seminar room will serve as the major way station and will have an adjustable glass enclosure with wood shutters to control light and air circulation.

The college's nontraditional, interdisciplinary curriculum inspired the center's creative programming, which includes an Epiphyte Screen: a vertical, dish-shaped structure overflowing with plants and rising mists that works as a projection screen, stage, and informal gateway into the canopy network.

While forest canopy systems exist in other parts of the world for research or eco-tourism, this one will be unique due to its location on a college campus, its subterranean component, and its incorporation of the public within a scientific facility.

"Recent research into [elevated] access systems has presented exciting new directions, including the possibility of integrating them into urban settings to grow high-value crops," says Peter Anderson, AIA. "This could offer a viable alternative to current agricultural patterns that contribute to deforestation." Similar issues will be explored at the upcoming Agro-Urban Ecology Conference, to be held at the University of Hawaii in March. *Sheri Olson*



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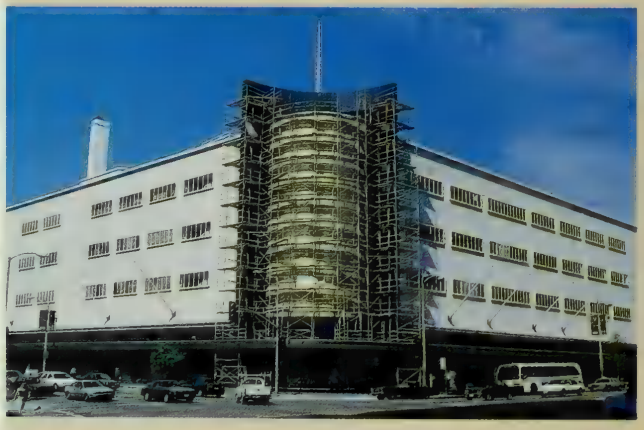
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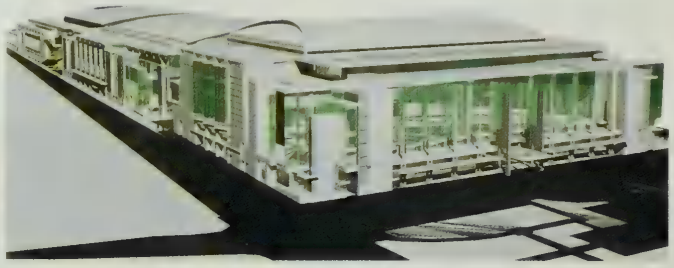
LACMA'S ARTISTIC EXPANSION The Los Angeles County Museum of Art is undertaking its first construction since the 1980s, with a three-prong strategy of renovating its main plaza, improving the 28-acre surrounding park, and refurbishing the former May Co. department store that houses its LACMA West branch. The museum sees the overall project as a step toward creating a "cultural village green" along Wilshire Boulevard.

Santa Monica's Kirkpatrick Associates designed the $2.5 million plaza overhaul. To start, the museum shop has been relocated to a new 2,200-square-foot building; unlike its predecessor, this store is wrapped with a retail-savvy wall of clear glass. A 1,000-square-foot café now occupies part of the former museum's space, while three kiosks—two on the plaza and one at the main street entrance—act as "concierge" stations.

The Hancock Park Improvement Project, slated for completion in March, will be a boon to both LACMA and the adjoining George C. Page Museum of La Brea Discoveries. The $12 million upgrade—financed by public and private sources—includes infrastructure improvements by landscape architect Laurie Olin and a 150-seat bermed amphitheater designed by sculptor Jackie Ferrara.

At LACMA West, Kirkpatrick has restored the old store's gold-leaf tesserae and black-marble Art Deco facade (below). The firm is now overseeing the $3 million interior renovation, which involves linking three first-floor galleries—including an 8,200-square-foot space for exhibitions organized by the Southwest Museum—by a retail promenade. Next on LACMA's agenda is more visibly uniting the entire museum campus. *Terry Bissell*





DESPITE ARGUMENTS OVER SITE, WORK IS STARTED ON D.C. CENTER

Ground was broken and fences were mended as the new Washington Convention Center got under way recently in downtown Washington, D.C. It will supplement an undersized, outdated facility several blocks to the south, and is scheduled for completion in 2003.

Designed by the Atlanta firm Thompson, Ventulett, Stainback & Associates (TVS) and topping out at 2.3 million square feet, the new center will be D.C.'s largest municipal (but not federal) project to date. It will feature a curved glass wall and extensive use of limestone, granite, and brick; the design is meant to assimilate with surrounding structures. Devroux & Purnell and Mariani Architects-Engineers are partners in the team.

Because the project straddles the commercial downtown to the south and a residential neighborhood to the north, it initially met with criticism. Residents of Shaw, the area just north, feared noise and exhaust would undermine recent neighborhood improvements. They proposed an alternative site at the Union Station rail yards, a more industrial area and, they felt, more appropriate for a huge building.

Meanwhile, the business community argued that the site, two city blocks, was too small, and that since there were no additional lots available for expansion, the building would soon be outmoded—the same predicament that befell the existing center. They argued that the Union Station site offered better opportunities for expansion.

After reviewing the TVS scheme, however, both sides seem relatively content. Ken Stockdale, project manager for TVS, reported that as much of the building was placed below ground as was practical, and that the volumes step down in size and scale as they reach the nearby residences. *Ellen Sands*

NEW URBANISTS THROW A PARTY AND INVITE THEIR CRITICS TO COME

Some of the top practitioners of New Urbanism gathered in September to talk about their work. That in itself wasn't unusual—but the audience was. The invitation-only program featured a number of New Urbanism's leading critics, including Colin Rowe and Alex Krieger. The idea, says architect Andres Duany, was to assess the successes and failures of New Urbanism and subject it to rigorous intellectual tests.

In recent years, the designing of traditional towns and communities has been embraced by developers, homebuilders, and civic officials, and even the Department of Housing and Urban Development, which is applying New Urbanist methods to many of its troubled public housing projects. However, it has not been widely accepted in academia, where Modernism rules.

The September meeting, intended to illuminate this rift, was held at Seaside, the Florida town that is in many ways the birthplace of New Urbanism and one of its shrines. Many designers presented projects, but they were immediately subjected to scrutiny and tough assessment.

Rowe pointed out that despite its achievements, New Urbanism hasn't developed a sophisticated formal vocabulary and suffers from lack of clarity in its use of forms. Other discussions ranged from design style to the appropriateness of "gating" communities.

Todd Bressi, urban designer-in-residence for the city of Scottsdale, Arizona, is editing the debates for a book to be published by Rizzoli—and there was no shortage of debate. Jaquelin Robertson talked of the "mess" the country has made of itself; Krieger argued that all was not lost, saying that the word "urbanism" should not be applied only to high-quality new and renovated places, because this denies the inner city its chance.

Next stop on the New Urbanism circuit is Harvard, where a similar program is planned for the spring. *Beth Dunlop*

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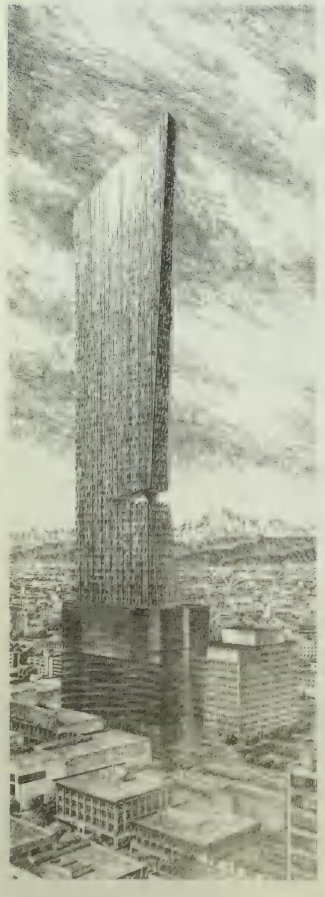
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DENVER DEVELOPER PLANS A TOWER INSPIRED BY PAKISTANI MOUNTAIN

Architecture critic Paul Goldberger once called downtown Denver "a disappointing collection of mediocre skyscrapers," and businessman W. Scott Moore agrees. "They're pretty unimaginative," he says. Now Moore wants to build a landmark 86-story skyscraper in downtown Denver, "something that would make a significant statement."

Moore has hired Los Angeles architect Richard Keating, FAIA, of DMJM Keating Architects to design his dream tower, which would be the tallest building west of Chicago.

Keating, former design partner with Skidmore, Owings & Merrill, has designed a number of office towers, including the 52-story Gas Company Tower in downtown Los Angeles. But Moore was unfamiliar with the architect's projects. "I was just going by his reputation," says Moore, whose office in the Republic Plaza building—at 56 stories, Denver's tallest—offers stunning views of Pike's Peak and the Front Range. "When I met him, we just hit it off."



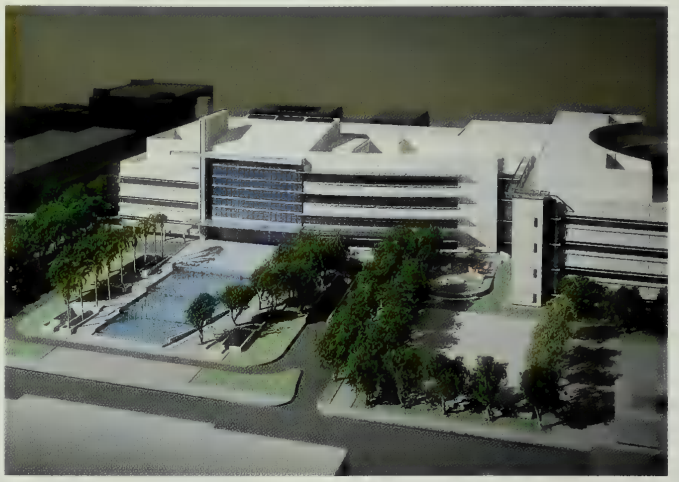
At their first meeting, Keating asked Moore to name a building "anywhere in the world" that resembled what he had in mind for Denver. Moore responded by showing the architect not a building but a *National Geographic* photograph of the Trango Tower, a 20,469-foot granite dagger in northern Pakistan.

"That was a surprise," Keating says. "Then it occurred to me that we could use the spirit of this mountain tower to inspire a design." Back in Los Angeles, Keating began working on preliminary drawings of the building he and Moore were now calling the Trango Tower.

Keating's design is indeed unlike anything Denver has seen. Set on a 17-story rectangular base, the wedge-shaped tower resembles a knife blade piercing the sky. One side tapers up to a 40th-floor observation plaza and then widens until it reaches the top, which is angled. Moore wants the building to be constructed of "golden brown" granite, just like the real Trango Tower.

The skyscraper, Moore says, would contain offices, shops, a high-end hotel, and luxury condos, some costing nearly $2 million. He admits that the residences could be a hard sell, "not necessarily because of the price but because of the concept." An increasing number of Denverites are moving downtown these days, but most have chosen to live in 19th-century commercial buildings that have been converted to lofts.

Moore's next step is to put together a development team and begin raising the money—as much as $400 million—to finance the project. Even if all the pieces fall into place, Moore says, completion of the Trango Tower is years away. But he's determined to leave his mark on the Mile High City. *David Hill*



AFTER EARTHQUAKE DEVASTATION, SANTA MONICA GETS HEALTHY HOSPITAL

The 1994 Northridge earthquake badly damaged the St. John's Health Center in Santa Monica, California. The center was subsequently required by law to begin construction on a replacement facility within five years.

In August, St. John's broke ground on the replacement: a new 450,000-square-foot, $270.8 million hospital that not only incorporates base-isolation seismic engineering to guard against future earthquakes, but is intended to raise the standard of health care design by taking new approaches to comfort and modern patient needs.

The building was designed by SMP/SHG Architects and HOK. The joint venture group worked with St. John's to address fundamental changes in health-care delivery as well as rapid and ongoing advances in medical technology.

Because more and more hospitals are geared toward outpatient care, the new facility is smaller and provides fewer beds than the one it replaces. Adjacencies between outpatient services have been carefully considered, and the most frequently utilized services have been placed within 100 feet of a large entry atrium, the focal point of the new facility, which floods the interior with light.

Much as I. M. Pei's glass pyramid at the Louvre serves to organize access to the museum's vast wings, the atrium at the new St. John's will make legible the myriad functions of the hospital that radiate from it.

Circulation routes for patients, visitors, and staff are independent. While staff corridors remain double-loaded and interiorized, single-loaded paths with views and abundant natural light, reserved for patients and visitors, will traverse the building's periphery.

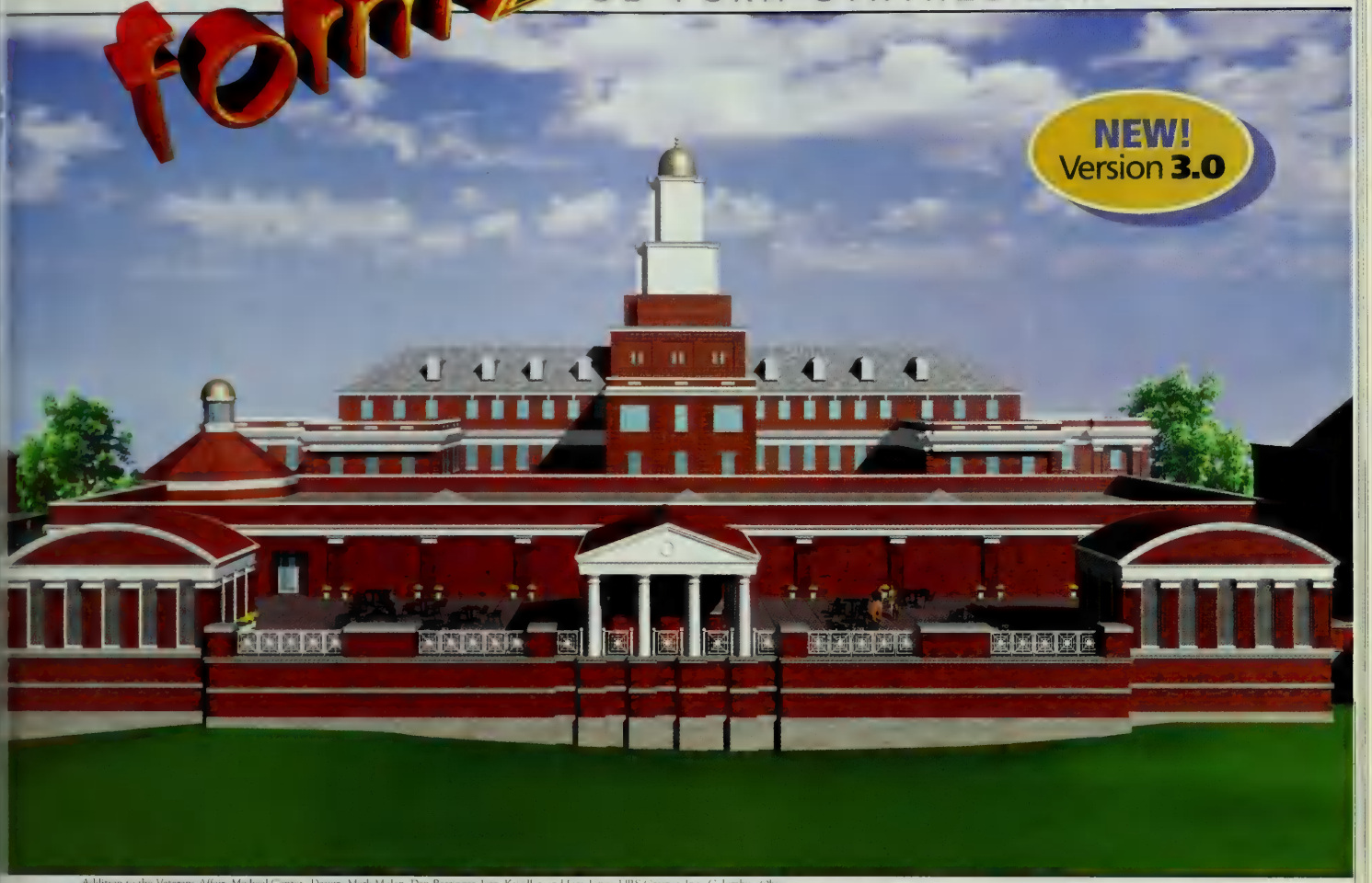
The ability to focus on familiar external landmarks will help to diminish pervasive feelings of alienation normally confronted in a hospital, according to the architects. "Dignity elevators" that connect underground parking and patient services will be available for those who wish not to be seen, either before or after treatment.

Finally, in keeping with the latest media technology, the new facility will be "paperless." Patient histories, X-rays, and other important records will be stored electronically.

St. John's is also planning online services for its patients and staff; direct access to the facility will be available for patients from their homes. With advances such as these, St. John's and its architects hope they will contribute to the well-being of the community in a broader and friendlier manner than before. *Alice Y. Kimm*

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ARCHITECTS' PATH ON INFO HIGHWAY CHARTED AT SEATTLE CONFERENCE

Just as highways influenced the form of American cities, the information highway will transform our cities in the future, according to presenters at "Seattle: City of Bits," a conference held at the University of Washington last month.

Keynote speaker William J. Mitchell, dean of the School of Architecture and Planning at MIT, said technology is issuing a wake-up call; architects need to understand the coming transformation and proactively address the opportunities it offers, which go beyond simple building design.

Speakers noted that bank branches are being replaced by ATMs and bookstores are losing business to Amazon.com. And as more work is conducted in home offices, suburban neighborhoods are becoming repopulated during the day. Services that cannot be replaced by electronic equivalents, such as restaurants and health clubs, could be relocated from city centers to these "live/work" neighborhoods, it was suggested.

The conclusion was that understanding which functions require face-to-face social interaction will become a critical skill for architects, whose choices could affect urban vitality. Increasingly, some client needs will be best satisfied with Web sites instead of bricks and mortar.

But architectural work will not necessarily diminish; design prowess will be needed in other venues. "[Architects'] skills in three-dimensional thinking are essential in the design of virtual environments," noted Finnish architect Immo Teperi. "We can't leave it to graphic designers and computer professionals."

Teperi described the 3D model of metropolitan Helsinki (above) which his firm, Arcus Software, has created for the Helsinki Arena 2000 project. Web surfers can "walk through" the model city and click on icons to read train schedules, for example, or listen to live concerts. The model's links to physical infrastructure, like representations of buildings and underground utilities, will also be useful to professional audiences: the workload for modelers is potentially vast.

Conference attendees agreed that no one knows how cities will be transformed, but architects' creativity will be key to directing their development. The conference was sponsored by the Jeanette and David McKinley Endowment for the Design of Future Architectural Environments. *B. J. Novitski*

THE GREENING OF THE MALL Several 1960s strip malls in the Boston area are going green. The malls' owner, Gravestar, based in Cambridge, Massachusetts, has hired the Manhattan architecture firm Croxton Collaborative to guide the renovations and help attain the goal of sustainability. Randolph Croxton, a partner in the architecture firm, explains that Gravestar "has concluded that environmental sustainability will create the best return on investment." Gravestar will spend $3 million per center, with completion due by 2000.

Storefronts will be daylit with long, slender skylights—just inside the front glass—to displace some of the electric lighting ordinarily used. Deeper into the stores, skylights of high-performance glazing will provide sharp shadows to animate the checkout areas. Solar panels, funded in part by a Department of Energy grant, are planned. And guidelines will be issued on topics such as selecting paints or sealants, recycling, and site-drainage techniques. Crescent-shaped ditches, used to percolate rainwater from the parking lots, will be planted with native grasses and trees.

If it uses the protocols, a supermarket with several locations will double the energy savings it could expect if renovations were undertaken without them, Croxton says. Improvements will be phased in as leases expire, although some tenants plan to undertake renovation immediately, with the landlord's financial support. The parties will split the savings in power costs. *Craig Kellogg*

A DISABLED ICON OF DESIGN IS REBORN AS OFFICE COMPLEX

The former headquarters of the Federal Reserve Bank of Minneapolis, widely admired after its completion in 1973 for a bold structural system in which the building "hangs" from a catenary arch, is being transformed into an office complex.

Designed by Michigan architect Gunnar Birkerts, the bank's curtain wall of black reflective glass was constructed in two planes to allow the arch to be seen outside. However, the unique structure also allowed water to seep inside and condense. Experts agree that the curtain wall has now completely failed.

After the Federal Reserve built a new headquarters, the old bank building stood empty for two years until a development group, FMR, decided it could be reborn as offices. Minneapolis architects Walsh Bishop were chosen to do the renovation, and a final design, with Karl Ermanis as project designer, was recently accepted. Construction should begin this winter on what is now called Marquette Plaza. The $55 million renovation includes adding a 10-story office tower on the east side. For the famous west facade, the architects devised a new curtain wall with an aluminum frame, again composed of two different planes—but this time with both inside.

The developer also plans to landscape the forbidding black granite plaza, which will become public green space with terraces at four different levels. By November 1999, the entire project should be completed, with state-of-the-art glass guaranteed to last. *Bette Hammel*



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NEWS BRIEFS

We the architects The National Constitution Center has chosen the design team for its new $130 million museum building: Pei Cobb Freed & Partners and Ralph Appelbaum Associates. Ground will be broken in September 2000 for the project, which will house interactive exhibits and activities that illustrate the U.S. Constitution's history and meanings.

Viva Venice Venice, which was built on a lagoon using a system of pilings and platforms, may be sinking. But the city isn't devoid of new architectural endeavors. British firm David Chipperfield Architects has won a competition to extend the San Michele cemetery, which sits on an island just north of Venice's main cluster. The project's first phase will involve a series of new courtyards, a crematorium, and a chapel in the existing cemetery. In the second phase, an uncultivated extension of the island will host the construction of courtyards, tomb buildings, and a system of gardens.



Millennium monoliths: a vision for Newport, Kentucky (above); a tower design for Paris (right).

Towering achievements Among the many projects being built to celebrate the year 2000 are a number of new towers—in very different locales. Swedish architecture firm Wingardh has designed the 900-foot-plus Scandinavian Tower outside Malmo, Sweden, with hopes of completion by the turn of the century. In Paris—where the Eiffel Tower is an emblem of the late 19th century—architect Nicolas Normier has designed a 656-foot-high structure called the Earth Tower. The building, to be made mainly from wood in a nod to fin-de-siècle environmental concerns, is budgeted at $41.7 million. Meanwhile, plans are under way in Newport, Kentucky, for a 1,000-foot tower to celebrate the millennium; the city claims it will be the tallest monument in the world (see related story, page 39).

Flight pattern HOK's aviation division is keeping busy. The firm has been chosen for two international projects: renovations and a new terminal at Johannesburg International Airport, and a new terminal at Wales Severnside International Airport. It will be HOK Aviation's first work in South Africa and in Wales.

Knock it off Faucet-maker Kroin has won a court battle to prevent Kohler, the largest plumbing fixtures supplier in the U.S., from distributing the Falling Water faucet. Kroin had claimed Kohler's product diluted the trademarked image of Kroin's Sanitary Fittings line, designed in 1968 by Danish architect Arne Jacobsen. Kroin says the decision has wide implications for designers

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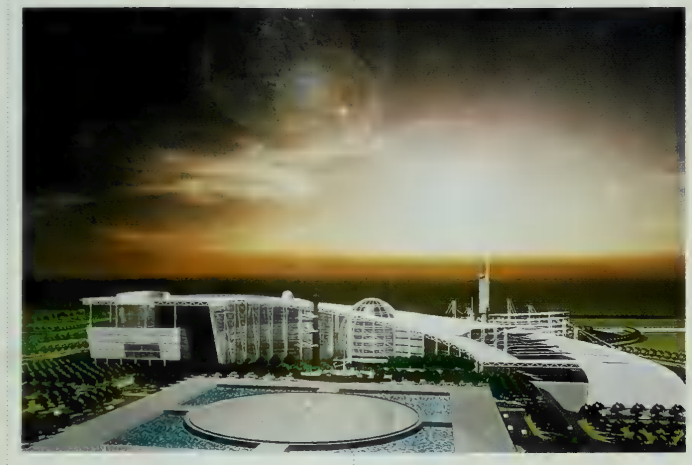
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and architects who want to prevent "knockoff" versions of their work.

Licensing update Congress has clarified a portion of the welfare reform bill it passed in 1996. As a result of that legislation, professional licensing (including architecture) was considered a public benefit; foreign architects who permanently reside outside the U.S.—even Canadians—started to have trouble obtaining or renewing licenses. Now, the issuance or renewal of a license to a foreign practitioner has been exempted. The AIA and the Canadian Architectural Councils had lobbied for the change.

Skate justice Skateboarding has become one of young America's favorite sports. But skating on the street has always been problematic, if not illegal. That's why Design Concepts has designed a 10,000-square-foot skatepark in Greenwood Village, Colorado. The park, which could open next summer at a cost of $200,000, will feature a variety of courses and was designed with the input of teenage enthusiasts.



RTKL in China: the proposed design for Shanghai Scienceland.

Honor roll This year's Chrysler Award for Innovation tapped two architectural firms among six honorees: Steven Holl Architects and Tod Williams and Billie Tsien. Meanwhile, the Carlsberg Prize, Denmark's highest architectural honor, has been awarded to Swiss architect Peter Zumthor.

Shanghai special During his visit to China this summer, President Clinton took time to help unveil plans for Shanghai Scienceland, a science museum and research facility. The $200 million, 950,000-square-foot project, slated for completion in October 2001, is being designed by American firm RTKL International. RTKL has proposed an asymmetrical, futuristic design overlooking Civic Plaza that the firm says will showcase the latest advances in science and engineering; for example, louvered solar panels will allow the building to be partially solar-powered.

Delayed performance Opening night for Hungary's new National Theater has been postponed for a year because of escalating costs and design changes. Original plans called for a 190,000-square-foot theater costing $28 million. However, during the design phase, the theater grew by 100,000 square feet and construction costs have soared to nearly $90 million. A proposed 200-seat studio theater has been eliminated, and an expansion of the main theater to hold up to 1,000 patrons—instead of 650—is being considered. The building is slated to open in August 2001. ■



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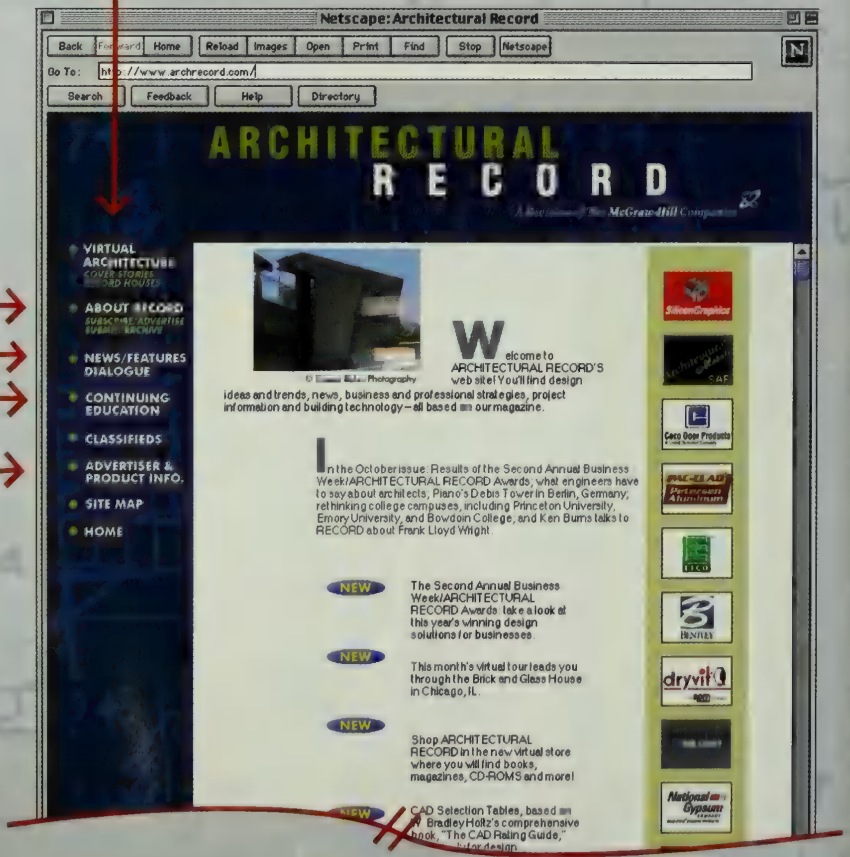
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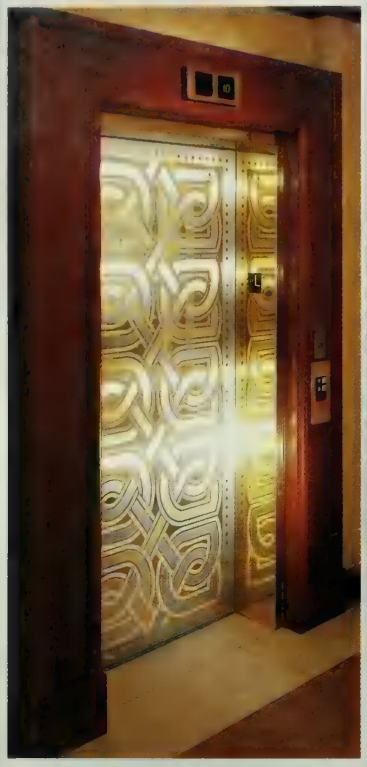
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CIRCLE 36 ON INQUIRY CARD

DATES EVENTS

Calendar

Berlin Constructions; Kapital Architectures
New York City
Through December 4
An exhibition and a symposium (on November 21) focusing on current construction in Berlin, both co-sponsored by Parsons School of Design and the Goethe Institute. Parsons Gallery (exhibition), 212/229-8987; New School (symposium), 212/229-8955.

Equal Partners
Northampton, Mass.
Through December 13
A celebration of male/female professional collaborations, featuring the work of 15 American firms founded and run jointly by men and women, including Arquitectonica, Asymptote, Hodgetts + Fung, and Tod Williams Billie Tsien Associates. Smith College Museum of Art. 413/585-2760.

The American Dream by Mail Order
Chicago
Through December 31
An exhibition exploring the history of Sears, Roebuck & Co. catalog houses built between 1908 and 1940. Chicago Architecture Foundation. 312/922-3432.

New Ways of Revitalizing the American City
Washington, D.C.
Through January 3, 1999
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

La Présence des Objets: Gaetano Pesce
Montreal
Through January 3
Furniture, objects, and models and plans of recent projects by the architect and industrial designer. Musée des Arts Décoratifs de Montréal. 514/284-1252.

Japan 2000: Kisho Kurokawa
Chicago
Through January 3
A retrospective of the Japanese architect's work, including early Metabolist projects to his current projects. The Van Gogh Museum in Amsterdam. Art Institute of Chicago. 312/443-3600.

Robert Adam: The Creative Mind
Washington, D.C.
Through January 3
An exhibition of work by the 18th-century neoclassical Scottish architect, demonstrating his process of design from conception to final presentation. Includes 66 drawings. The Octagon. 202/638-3105.

Bechtel's First Century
Washington, D.C.
Through January 4
A portfolio of projects by the San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms. Highlighted projects include the Hoover Dam, San Francisco's rapid-transit system, and the Channel Tunnel between England and France. National Building Museum. 202/272-2448.

Tensions in Architecture
New York City
Through January 5
An examination of the extraordinary recent developments in the materials and technology of tensile structures. Material ConneXion Gallery. 212/445-8825.

Designing the Disney Theme Parks
New York City
Through January 10
"The Architecture of Reassurance" examines how Disney attractions are conceived, planned, and built. On display are 200 plans, drawings, paintings, and models from Disney archives, many of which have never been publicly displayed. Cooper-Hewitt National Design Museum. 212/849-8300.

George B. Post: Great American Architect
New York City
Through January 10
Among the works featured in this exhibition of the late-19th- and early-20th-century architect are renderings of the long-demolished Equitable Life Assurance Society (the first building to use elevators) and the Western Union Building (the first to reach 10 stories). New-York Historical Society. 212/873-0509.

Premises: Invested Spaces from France
New York City
Through January 11
An exhibition of visual arts, architecture, and design in France from 1958 to 1998 that underlines the relationship between the artist/architect and the constructed environment. Included are models, drawings, photographs, and installations

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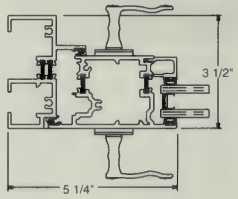
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at World Golf Village,
St. John's County,
St. Augustine, Florida

Architect:
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by Christian Boltanski, Yves Klein, Le Corbusier, Jean Nouvel, and Annette Messager, among many others. Guggenheim Museum SoHo. 212/423-3500.

Ali Wright: The Dana-Thomas House
Chicago
Through January 31
An exhibition showcasing the most complete and best-preserved example of Frank Lloyd Wright's early Prairie houses. Chicago Architecture Foundation. Call 312/922-3432 or fax 312/922-0481.

Louis Comfort Tiffany at the Metropolitan Museum of Art
New York City
Through January 31
Nearly 100 Tiffany works from the museum's collection, including windows, lighting fixtures, and objects, are featured. The full-scale entrance loggia from Tiffany's Long Island estate is also on view. Metropolitan Museum of Art. 212/570-3951.

City Satire: The Cartoons of Roger K. Lewis
Washington, D.C.
Through February 28
More than 100 cartoons satirizing the state of architecture and urban design, originally published in the *Washington Post*. National Building Museum. 202/272-2448.

Build Boston
Boston
November 17–19
The Northeast's premier trade show and convention for building products will have more than 350 exhibitors and 10,000 attendees. Over 180 professional workshops will be offered. Call 800/544-1898 or visit www.buildboston.com for details.

AIA Leadership Institute
Los Angeles
November 19–22
The AIA has teamed with the National Leadership Institute to offer a three-day course in leadership skills for architects. AIA members receive a substantial discount off the normal cost of the program. To register, call Emily Cole, manager of AIA Continuing Education, at 202/626-7445.

Healthcare Design Symposium
San Francisco
November 19–22
The health-care design industry's premier conference includes three days of plenary sessions, an exhibition of products and services, an awards banquet, and tours of local health-care facilities. Call the Center for Health Design at 800/955-1226 or visit www.hcaredesign.com for details.

Thermal VII
Clearwater Beach, Florida
December 6–10
A conference focusing on the latest technologies related to the thermal performance of building envelopes. The core conference and workshops meet AIA/CES criteria for quality levels II and III, respectively. Sheraton Sand Key Resort. Call Mia Prater at 423/576-7942 for details or E-mail her at unb@ornl.gov.

IASTE '98
Cairo, Egypt
December 15–19
This year's conference of the International Association for the Study of Traditional Environments examines how nations are cultivating traditional architecture as a means of attracting tourism. There will be about 120 papers presented by scholars from around the globe. Contact the Center for Environmental Design, University of California at Berkeley. 510/642-2896.

Celebrating Chandigarh
Chandigarh, India
January 8–11
An international conference marking the 50th anniversary of the Punjab capital's conception includes discussions of how its design, by Le Corbusier and many others, affected city planning in developing



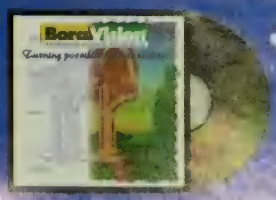
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nations around the world. Call 011/91/172/548742 or visit www.cperspectives.org for details.

Competitions

Intern Development Program Outstanding Firm Award
Submission deadline: November 13
Sponsored by the AIA's Intern Development Program, this award honors architecture firms that give outstanding support to interns by providing comprehensive training opportunities, promoting mentorship and participation, and encouraging supplementary education activities. For an entry form, call David Roccosalva at the AIA, 202/626-7325.

FabStruct '99
Submission deadline: December 4
A competition that challenges students to design a hypothetical international student center, built from fabric membranes, for the Millennium Dome currently under construction in Greenwich, England. Call Arik Hanson at 800/225-4324 or visit www.ifai.com.

Rudy Bruner Award for Urban Excellence
Submission deadline: December 18
This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives $50,000. Call 617/492-8401 x139 (please mention ARCHITECTURAL RECORD) or E-mail info@brunerfoundation.org for more information.

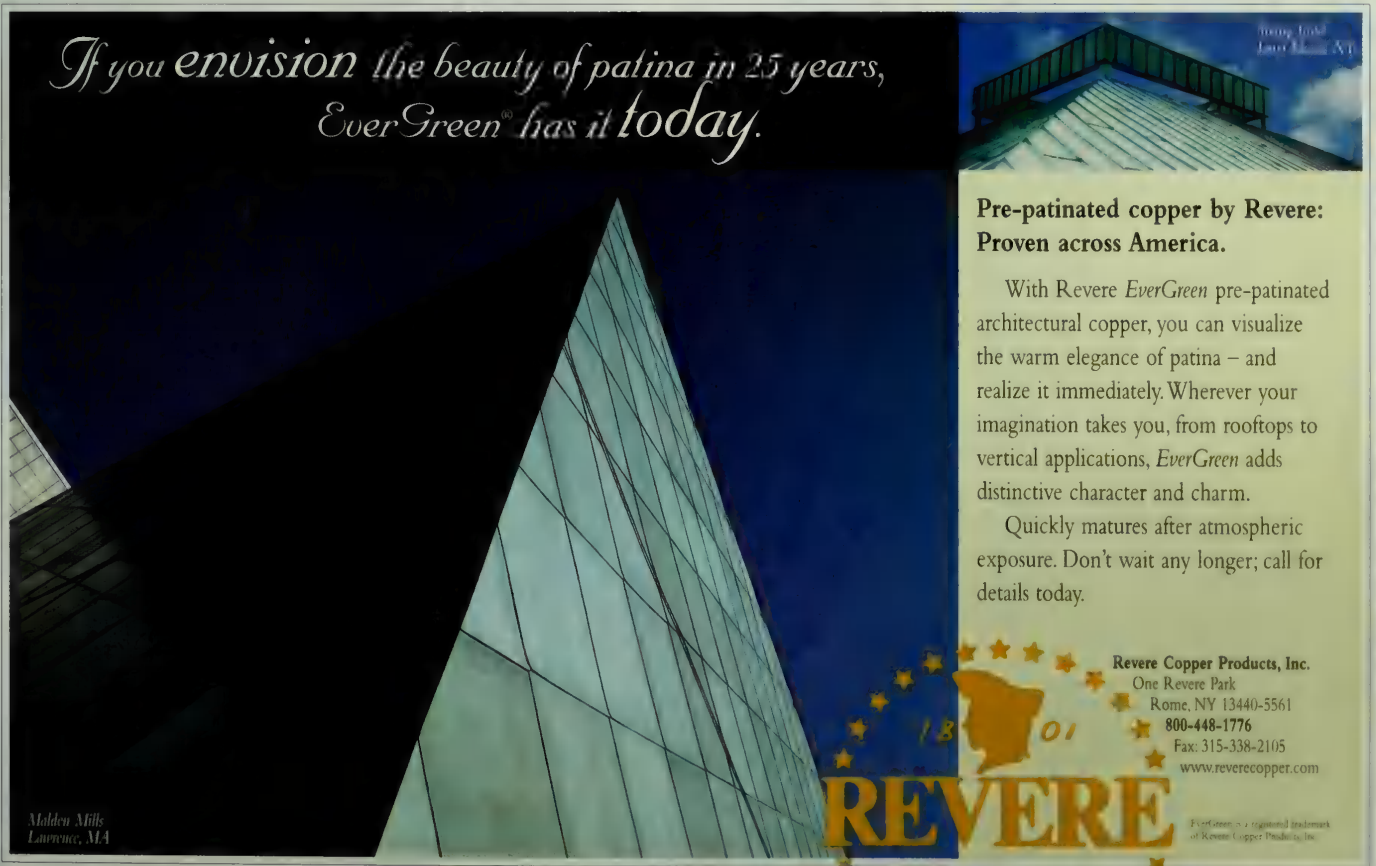
London AIA Excellence in Design Awards
Submission deadline: January 15
The awards program honors excellence in architectural design for work completed between January 1, 1993, and December 31, 1998. Eligible are projects by U.K.-based architects working anywhere in the world; projects in the U.K. by architects from anywhere in the world; and projects in the U.K by U.K.-based students. For more information, write AIA, Kent House, 14–17 Market Place, London W1N 7AJ, or fax 011/44/171/636-1987.

James Beard Foundation/ Interior Design Awards
Submission deadline: January 29
Established in 1995 to honor excellence in interior and graphic design for restaurants, these awards are for projects in the United States and Canada. For information, write the James Beard Foundation, 6 West 18th Street, 10th floor, New York, N.Y. 10011 or visit www.jamesbeard.org.

Library for the Information Age
Submission deadline: January 31
The first international Web-based architectural design competition, sponsored by the Association for Computer-Aided Design in Architecture, calls for the design of a library that takes full advantage of information technology while still serving the library's roles in culture and society. Proposals may incorporate spatial simulation and/or physical solutions. Open to student and professional designers worldwide. Visit www.acadia.org/competition/ for more information.

Union Internationale des Architectes Student Competition
Submission deadline: January 31
Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. Call Liu Kecheng at Xi'an University, Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn for registration information. ■

Please submit information for events and competitions at least six weeks prior to the magazine's publication date (December 15 for the February issue).



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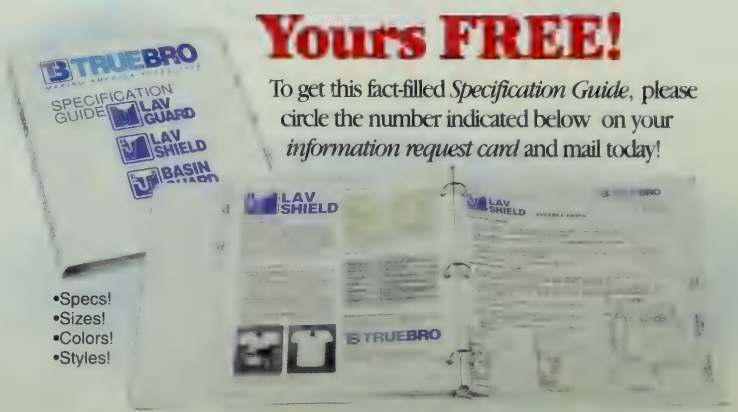
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For 85 years, children with dreams of performing have attended the renowned Perry-Mansfield Performing Arts School and Camp. Now the oldest, continually-operated dance and theatre camp in the country, its distinguished alumni include; Doris Humphrey, Merce Cunningham, Agnes de Mille and Dustin Hoffman.

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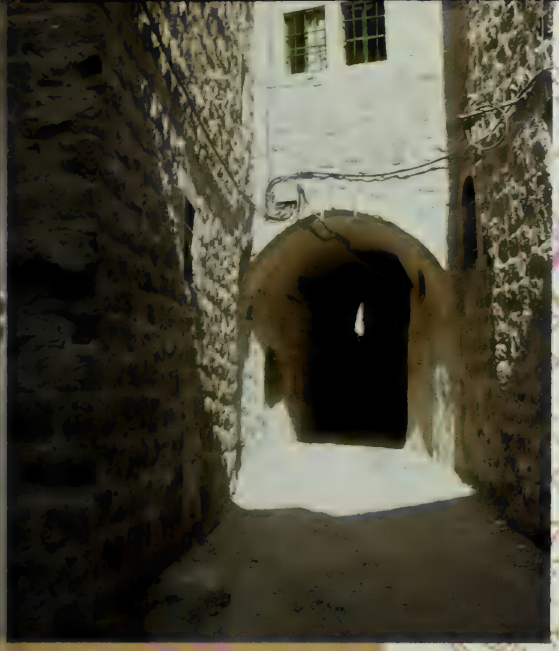
THE AGA KHAN AWARD:

Honoring Substance Over Style

INTERNATIONAL IN SCOPE, DIVERSE, SERIOUS, AND WELL-RESEARCHED, THE AGA KHAN AWARD MAY BE THE WISEST ARCHITECTURAL PRIZE PROGRAM WE HAVE, ACCORDING TO ROBERT CAMPBELL.

Window detail, Lepers Hospital, Chopda Taluka, India.





A revitalized street in Hebron Old Town.

PHOTOGRAPHY: COURTESY AGA KHAN AWARD FOR ARCHITECTURE THROUGHOUT
© RAM RAHMAN (HOSPITAL); GUVEN INCIRLIOGLU (HEBRON)

by Robert Campbell, FAIA

The Aga Khan Award is the wisest prize program in architecture. It's the most serious, the most thoroughly researched, the most thoughtful. It's almost the only one that deals with anything more important than the latest fashions in forms or ideas. In fact, not being about fashion is one of its goals.

The awards are given, every three years, to distinguished works of architecture in the Muslim world. There are seven prizes for 1998, which were bestowed on October 9 at the Alhambra Palace in Granada, Spain. The Alhambra, of course, is an Islamic building that's on anyone's short list of the world's greatest works of architecture. The people at the Aga Khan Trust for Culture, which administers the award, always do that: they pick a stunning Muslim site for the presentation. So the ceremony itself displays Islamic culture to the international crowd of critics and architects who gather. It's typical of many smart moves on their part.

Historian William Curtis, writing in this magazine, gave an excellent definition of the award: "The Aga Khan Award for Architecture is more than just a prize that is given every three years for distinguished architecture in Islamic countries. It is also an evolving enquiry which has as its aim an authentic built environment for the Muslim world. The homogenization or deracination which stems from facile imitation of Occidental models is rejected. So too is the false remedy of a shallow imitation of the local past."

But this isn't merely a Muslim problem. It's an issue we all face. Western architects, too, create "facile imitations of Occidental models." If we all go on doing that, the whole built world will eventually look the same, a nightmare that comes closer every day. On the other hand, if we try to preserve a sense of place by cloning the local past, we're just faking. When Curtis talks about "an authentic built environment," he's describing the problem of striking the right balance between the local and the global—an issue that such critics as Kenneth Frampton have made central in architecture. Nobody else is investigating it with quite the passion and intelligence of those who present the Aga Khan Award.

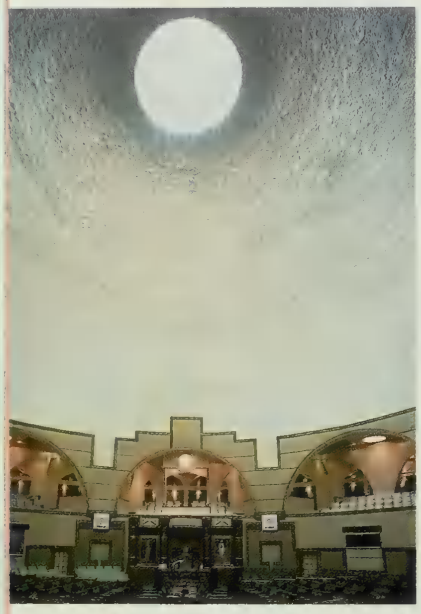
This year's winners, as usual, run a wide gamut. There's a sewer-improvement plan for a desperately poor district, and there's a palace of recreation for diplomats. All of them address real-world problems, and they're not necessarily conventional architecture. Nothing this year comes quite as close to falling off the architectural screen as the 1995 prize for a tree-planting program in Turkey, but the seven 1998 winners range almost as far.

In Indore, India, a "slum networking" project upgraded a squatter settlement by installing a minimum of new infrastructure, especially sewers. It then engaged the energies of the slum dwellers by offering them free land leases. No longer squatters, the residents responded with further improvements of their own. They built their own connections to the new sewers, then went on to upgrade their dwellings. By means of a small public investment, a self-help community was formed.

Incidentally, nobody's queasy about calling a slum a slum, and they avoid inventing blather about the economically challenged. "A slum is an organic entity that grows and, if evicted, simply moves," reports the award jury. "Slums are present in all cities, but once acknowledged they can become meaningful parts of a whole city." Is "slum networking" architecture? Well, if you define architecture as the art of making places for human habitation, it is.

Robert Campbell, FAIA, is the architecture critic of the Boston Globe *and a contributing editor of this magazine.*



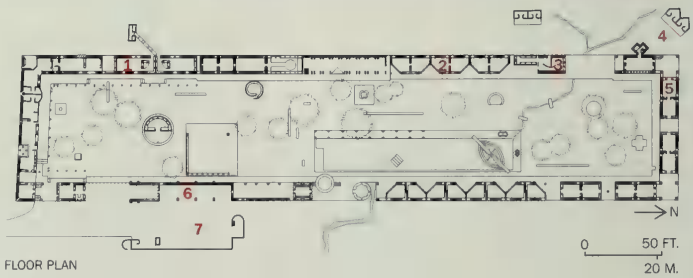


Vidhan Bhavan *(State Assembly), Bhopal, India*
Architect: *Charles Correa*
Client: *State Government of Madhya Pradesh*

Lepers Hospital, *Chopda Taluka, India*
Architects: *Per Christian Brynildsen and Jan Olav Jensen*
Client: *Norwegian Free Evangelical Mission, India Trust*



1. *Staff quarters*
2. *Female ward*
3. *Clinic*
4. *Toilets*
5. *Male ward*
6. *Buffalo shed*
7. *Poultry shed*



FLOOR PLAN

In Hebron, now part of Israel, the historic Old Town was left 85 percent abandoned after the conflicts of the 1960s. In 1995, a group began restoring the neighborhood's historic stone houses. So far they've completed 127 dwellings, with 95 other buildings in progress. Residents and shops are moving back. In its usual dry, diplomatic language, the award jury touches on what must have been appalling political hassles: "Many sensitive issues had to be faced, among them such technical complications as land and property ownership, or such complex questions as cultural identity and historical consciousness."

NOBODY'S QUEASY ABOUT CALLING A SLUM A SLUM, AND THEY AVOID INVENTING BLATHER ABOUT THE ECONOMICALLY CHALLENGED.

In Chopda Taluka, India, two Norwegian architecture students on a study trip were convinced to design a hospital for lepers. The students created a square of dormitories that surrounds a protected center of trees and flowers conceived as a "paradise garden." The students spent more than a year overseeing construction, which was performed by 70 workers using entirely local materials and working without power tools (except a truck and, for a time, a concrete vibrator). The students developed a system of shallow brick arches, which were then roofed in broken glazed tiles salvaged from a nearby factory. After the students went back to school in Norway, the local residents finished the job on their own. Today the hospital serves several hundred outpatients and 30 to 40 live-ins.

In Selangor, Malaysia, a private residence for a physics professor and his family embodies three separate themes. It is a modern house with contemporary conveniences, it is a revival of traditional Malay construction and materials, and it is an exploration of sustainable ecological design that has minimal environmental impact. Using local chengal wood, which is noted for its resistance to water and termites, a master carpenter and his team spent six years cutting each wooden joint, then assembled the house without metal fasteners. The design includes climatically appropriate features, such as a wraparound veranda. It also includes a prayer space, and it faces Mecca, as do traditional Malay houses. In its contrast with recent architecture of the area—much of which is high-rise apartments—the villa points out a more responsible direction.

In Bhopal, India, a new State Assembly building—the equivalent of an American state capitol—avoids any imitation of the Colonialist power architecture of the Indian past. Instead, it breaks its many functions down into a complex system of courtyards and entrances. Its circular form, a rough mandala on a hilltop site, proclaims that this is a public building while also nodding to icons such as an ancient Buddhist



Slum Networking of Indore City, *Indore, India*
Planner: *Himanshu Parikh, Civil Engineer*
Client: *Indore Development Authority*
Completion: *1989 and ongoing*



Rehabilitation of Hebron Old Town, *Hebron, Israel*
Planners/Conservators: *Engineering Office of the Hebron Rehabilitation Committee*



Alhamra Arts Council, *Lahore, Pakistan*
Architect: *Nayyar Ali Dada*
Client: *Lahore Arts Council*

stupa nearby. But the Assembly reads more as a walled city than a single building. Inside its outer wall, it is a labyrinth of bridges and ramps and courts and gates and small domes. The building, says the jury, "develops a new imagery based on local forms....It breaks the myth that modern architecture cannot be adapted to Asian nations and environments."

In Lahore, Pakistan, the Alhamra Arts Council is a complex of galleries, auditoriums, practice rooms, and a theater, serving local artists, music students, and the public. Its bold polygonal volumes are intended to enhance acoustics, and its solid red-brick walls recall the traditional red sandstone of the Mughal era. Green courtyards thread among the buildings. The complex is used by more than 3,000 people a day, and the theaters accommodate two sold-out performances each night. The jury says the design, which "recalls the images of Mughal forts without reverting to clichés or symbols... has restored Lahore's role as the cultural capital of Pakistan."

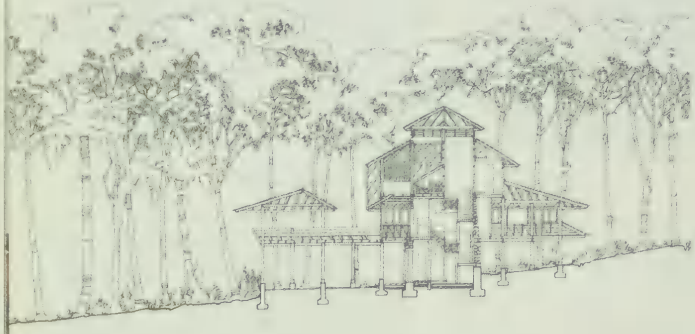
In Riyadh, Saudi Arabia, Tuwaiq Palace is a new cultural and recreation center for the diplomatic quarter of a national capital. An astonishing collision of East and West, it's the product of a limited design competition that included the following mandate: "Any form of revival style or copying traditional patterns and details in old or new material, thus creating false 'Neo-Orientalism,' will not be acceptable." When the sponsors viewed the competition entries, they asked two of the competitors to join forces—usually a recipe for disaster. The two were Frei Otto of Germany, known for his signature high-tech Teflon tent structures, and the firm Omrania of Riyadh. The two created a building in which Otto's tents cluster around a stone building by Omrani that wraps itself, snake-like, around a green oasis. As the jury says, "From a distance, Tuwaiq Palace appears to be a ruined fort surrounded by an encampment.... Much Saudi development in the 1980s consisted of a slavish and glossy imitation of Western building models. Tuwaiq Palace is a bold departure from this trend, touching instead upon easily understood signals from past desert civilizations: tents, walls, oases, fortifications."

What is most striking about these seven winners is that each is, in some way, more than a building. Viewed purely as architecture, none of them ranks as a work of world significance. It's better to think of them as probes, as explorations of a question: How best to create a responsible environment. And the jury report treats them that way. Each is lauded not so much for its individual excellence, or its success as architectural art, but rather for the issues it raises, for the way it contributes to an ongoing debate about human accommodation. Suha Ozkan, the current secretary-general for the awards program, puts it this way: "Many outstanding designs are being realized in the world; but it is the social dimension that validates one of those designs as being worthy of the Aga Khan Award."

Certainly no other awards program goes to anywhere near the same amount of trouble. A steering committee of nine members, chaired by the Aga Khan, establishes the policies. Its membership currently includes scholars and architects from the Muslim world as well as Peter Eisenman and Charles Jencks. The steering committee then appoints a



Salinger Residence, *Selangor, Malaysia*
Architect: *Jimmy C.S. Lim*
Master carpenter: *Ibrahim bin Adam*
Client: *Rudin Salinger and Munira Salinger*







Tuwaiq Palace, *Riyadh, Saudi Arabia*
Architects: *OHO Joint Venture: Atelier Frei Otto; Buro Happold; Omrania*
Client: *Arriyadh Development Authority*

master jury, which receives nominations of buildings from an international network of some 200 nominators. The nominators, whose names are kept secret, are persons familiar with the Muslim world. Other people are free to suggest candidates, too, and if these are found eligible, they are forwarded to the nominators, who may or may not choose to include them. The awards cover the entire Islamic world; there's never a bias in favor of the Khan's own Ismaili sect.

TECHNICAL REVIEWERS, ALL ARCHITECTURAL PROFESSIONALS, FAN OUT TO VISIT ALL THE SITES. THE PROCESS TAKES THREE YEARS.

The process results in some 500 nominations. The master jury then meets and cuts the list to around 100. The architects of these 100—who up to now don't usually know they've been nominated—receive a documentation package. They must submit some 30 to 50 pages of information about the building or project, including complete architectural drawings. The master jury then meets again, reviews the documented projects, and creates a short list of about 25 or 30 projects. Now the process gets really intense. Technical reviewers, all of whom are architectural professionals, fan out to visit all the sites. The only restriction here is that a reviewer isn't allowed to visit a project located in his or her own country. This year, for the first time, these site inspections were documented on video. I saw rough footage of one such visit, and it was extremely thorough, with many hours of interviews of the architect, the users, the builders, and anyone else who mattered. The master jury then convenes for a final five-day session, at which the reviewers present their findings and the jury votes for the winners. The jury discussions are taped, edited, and published.

The whole process takes three years. The first awards were announced in 1980, making the 1998 awards the seventh cycle. The prize money is substantial: a total of half a million dollars is divided among the winners, several times the amount of the Pritzker Prize. This year's master jury, which chose the winners I've listed above, was, as usual, diverse: Mohammed Arkoun, an Algerian-born professor of Islamic thought at the Sorbonne in Paris; Zaha Hadid, the avant-garde deconstructivist who works out of London; Saleh al-Hathloul, a Saudi critic and educator; Arif Hasan, a Pakistani architect and planner; Japanese architect Arata Isozaki; Fredric Jameson, an American cultural theorist; and Rami Kosla, an Indian architect. Although the majority of jurors is always Muslim, past juries have included such non-Islamic notables as Kenzo Tange, Charles Moore, James Stirling, Hans Hollein, Robert Venturi, Fumihiko Maki, and Frank Gehry.

This elaborate jury process is only the tip of the iceberg. The Aga Khan Program in Architecture runs seminars on all kinds of archi-

THE AGA KHAN: BUILDING FOR HIS PEOPLE



His Highness the Aga Khan, who presented the awards that bear his name in Granada, Spain, on October 9. Twenty years have passed since the program's inception.

As I get older, I find I have to explain who the Aga Khan is more often. That wouldn't have been a problem when I was a kid at the flicks, watching the Movietone News. Annually, the Aga Khan of those days, an overfed elderly gentleman, was shown sitting on one side of a scale while his followers piled gold and jewels on the other side until they'd equaled his weight. That Khan's son, Aly Khan, was a tabloid sensation for his marriage to film star Rita Hayworth.

Back then, today's Aga Khan, young Karim, was an unknown student at Harvard (in the same class with this writer, as it happens), a sort of superkid—honor student, athletic, handsome, charming, and much more sophisticated than the rest of us. Then, suddenly, the old Khan died, leaving behind an unexpected decree: his son Aly was to be passed over, and grandson Karim, instead, would be the new Aga Khan. Karim dropped out of school for 18 months, then returned to prepare himself for his new career. "I've never worked so hard," he said.

The Aga Khan is the Imam, or spiritual leader, of a sect of Muslims known as the Ismailis, of whom there are perhaps 20 million scattered around the world, most of them in Asia, Africa, and the Middle East.

This Aga Khan doesn't get himself weighed in jewels. Almost as soon as he took the job, the Aga Khan found himself building schools and hospitals for his people. And he discovered that in a world overwhelmed by Westernization, nobody knew how to build in a way that could serve the needs of the modern world while still respecting the cultural heritage of Islam. The Aga Khan Award in Architecture, which was begun in 1977, was the result. *R.C.*

tectural issues, all around the world. It sponsors a program in Islamic architecture, which is based at Harvard and MIT but linked to other institutions in Muslim nations. It maintains an Islamic architecture archive of more than 200,000 slides and prints, in addition to books and other publications. For some years, it published a magazine, *Mimar,* which is now defunct. And in 1988, the Aga Khan established the Historic Cities Support Program, which directly funds improvements to historic areas of Muslim cities.

I've had the good luck to talk with the Aga Khan two or three times over the years. It sounds corny to say it about someone who is, for millions, a spiritual demigod, but he's a warm, well-mannered, extremely intelligent man who thinks long and hard about everything he does. In one interview, I asked him what he considered to be typical characteristics of Islamic architecture. After making sure I understood that he didn't want his personal opinions to be considered anything more than just that, he did express some provocative thoughts.

In Islamic tradition, he said, "Vanity is an expression which in general has been discouraged. What is in competition with God's creation—you wouldn't necessarily find that in the tradition. The use of elements which are of God's creation in the physical environment—water, vegetation, anything which embellishes life, which improves the quality of life—is very much particular to Islam. If you think of the Arab climate, water is important.

"Changing the scale of the individual in the environment is part of the tradition. You'll find doors of different sizes, sightlines that change, roof heights that change, because any sense of totality, of man's dominance over his environment, should be discouraged. He doesn't control his destiny, God controls his destiny. Anything that comes back and reminds man in his environment that things can change and change rapidly, over which he has no control [is part of Islamic tradition].

"I think you find more use of geometry and calligraphy [in Islamic architecture]. There was a tradition that the visual representation of God's creation was not acceptable; therefore, in the most rigid of interpretations, the representation of animals, flowers, birds, things like that, was disciplined. So geometric patterns and embellishment of calligraphy became the methods of embellishing a building. That changed as the culture expanded and absorbed other cultures.

"At least these things should be known. Whether they are appropriate or not appropriate is not for me to decide."

The seventh cycle: it sounds like a round number, almost like a closing. Has the award, perhaps, finished its work? What has it accomplished? Has it been worth the enormous effort?

I talked to people who, at one time or another, have been involved in some way with the Aga Khan Award. They were unanimous in believing that the program has achieved its original goal. The Khan defined that goal in the interview quoted above: "I was hoping to destroy the concept that the only way you can improve the quality of life is through the wholesale importation of other *(continued on page 196)*



CUSTOM-MADE FOR THE MEGARICH

A megahouse is a status symbol for the wealthy and a major statement—to family, peers, and colleagues. Many people can have a Mercedes or a nice wardrobe. But not many have a custom-designed house.

Designing Megahouses: When Money Is No Object

by Wendy Moonan

America's first megahouse was probably Mount Vernon. George Washington's mansion near Alexandria, Virginia, measured 17,248 square feet, not including the dependencies: kitchen, salt house, wash house, slave quarters, coach house, conservatory, threshing barn, grain barn, and livestock buildings. Washington was a great architect, and he was as skilled at planning and landscape architecture as he was at designing buildings.

We can still see traces of Washington's architectural ambitions in the Mount Vernons of today, but most other things have changed. The clients who commission huge houses are more numerous and diverse. The buildings themselves are getting larger and larger. The desire for the latest technologies has intensified. As a result, many architects are facing very unusual design challenges—and moral quandaries—as they work on plans that border on the surreal.

Start with the clients. Unlike Washington, who was often on the brink of financial ruin, today's megahouse owners are megarich. Most are either self-made men—entrepreneurs and computer moguls—or businessmen and investment bankers. They are smart, independent, and self-confident, and they all share the building bug.

Robert A.M. Stern, incoming dean of the Yale School of Architecture, has built at least 50 large houses for "people who like to make decisions—and are not afraid of their possessions." The megahouse trend, he explains, "has taken on a greater velocity as the baby boomers have come into their maturity and affluence. They are the yuppies who repopulated the cities in the 1980s and now want to have big places in the country."

Wendy Moonan is the architecture editor at House & Garden *and a frequent contributor to ARCHITECTURAL RECORD.*

Giant houses, giant egos

Jaquelin Robertson of Cooper Robertson has designed several houses for CEOs, including a 30,000-square-foot house for Wall Street titan Henry Kravis in Casa de Campo, Dominican Republic; an Aspen house for publisher Mort Zuckerman; Hamptons beach houses for financial powerhouses like Leon Black and Alan Washkowitz; and a Fifth Avenue apartment for billionaire David Koch.

Charles Gwathmey of Gwathmey Siegel Associates in New York attracts creative powerhouses, such as Steven Spielberg, Universal Studios chairman Ron Meyer, and Jeffrey Katzenberg of Dreamworks. "Our clients endorse modern architecture," Gwathmey says. "They are risk-takers interested in intellectual and artistic discovery. They believe in the idea that what they are getting is unknown. They are adventurers who love the collaboration and the intensity of it all."

Mark Hutker, an architect whose boutique firm is on Martha's Vineyard, says his megahouse clients are "people at the top of their game: artists, writers, composers, bankers, and lawyers. They are A-types times four." Preston Phillips, an architect in Bridgehampton, New York, says he often designs for "people who do not work for other people. They



"THE YUPPIES WHO REPOPULATED CITIES IN THE 1980s NOW WANT TO HAVE BIG PLACES IN THE COUNTRY."

are major CEOs or creative types, like [composer] Samuel Barber and [artist] Lowell Nesbit."

Of course, some architects, like Bart Voorsanger in New York and Mark Simon of Centerbrook Architects in Essex, Connecticut, boast old-school, Social Register clients—but these are the exceptions. Old-money types tend to buy old houses. And what happens when they commission new ones? "Not all of them have an aesthetic sense," says Simon. "Some are tone deaf."

The space race

As in the glory days of the Newport mansions, the wealthy are asking for space, space, and more space. Why, exactly, do the houses have to be so large? "Good question," says architect Richard Meier. "Perhaps clients are more narcissistic than before. They also like to work at home."

"It's the economy, stupid," jokes Donald Rattner of Ferguson, Shamamian & Rattner Architects. Rattner's New York firm has designed a controversial 52,000-square-foot version of a Tuscan villa in Southampton, New York, for Ira Leon Rennert of the Renco Group, whose net worth is estimated at more than $500 million. The house's size does not include the 17,000-square-foot garage for 100 cars or 14,440 square feet of porch and terrace areas. The compound's size and the estimated cost of $100 million (as reported in the *New York Times*) have rubbed many locals the wrong way. In fact, the house has upset so many people that the Town of Southampton is considering a new law limiting the size of single-family houses. Nonetheless, construction is proceeding as planned.

Bill Gates's $53 million house in Medina, Washington, seems, in contrast, relatively modest at just 40,000 square feet, with a 30-car garage. It was designed by James Cutler of Seattle and Peter Bohlin of Bohlin Cywinski Jackson of Pittsburgh and Seattle.

"Why not build a big house?" asks Francis Fleetwood, an East Hampton, New York, architect who says he has built at least six classic, Shingle Style houses in the Hamptons every year since 1979. "For most of my clients, the house costs a tiny percentage of their net worth. If they weren't so particular, they'd buy a house that's on the market."

Ned Forrest, an architect in Sonoma, California, says his clients "have an urge to look like old money, so they want houses that hark back to earlier eras. Vineyard owners gravitate toward Tuscan villas or Provençal manor houses. Computer whizzes want traditional European styles."

For some of Preston Phillips's clients, "A house is a statement—to families, peers, and colleagues. Today, anyone can have a Mercedes, a great wardrobe. But not everyone can have a custom home." He described a West Virginia couple who wanted a "spaceship" in a neighborhood of traditional red brick houses. They got it.

Special needs

Along with the desire to dazzle the neighbors and display their worldly success, megahouse clients often have specific lifestyle requirements. They may need an up-to-date home theater, or they may want special security measures, for fear their kids could be kidnapped. Though they want visitors to be impressed, they want to do it on their own terms.

"Why do people build such big houses?" asks Thierry Despont, a French architect based in New York City who has built several huge multimillion-dollar houses. "One word: privacy." Supporting that notion, most of the architects contacted for this article couldn't reveal the names of their clients. Despont's answer is echoed by one of Stern's clients, who says he likes his Aspen vacation house because "we can do every single thing we want to here without leaving the property."

Gwathmey recently designed a Modernist megahouse for two top Hollywood players. In their glass, steel, and stone Pacific Palisades hilltop aerie, the man, a director, and his wife, a producer, can do everything but shoot film. They have separate, his-and-her offices for writing (with shelves designed for film scripts), a large conference room, a rare-book library, a film-editing room, a sports bar, a lavish screening room with a separate entrance, a gym, a nanny suite, and a house manager's office. The "locations closet" is reserved for shoot preparations, with suitcases of all sizes, prepacked first aid and emergency repair kits, and rows of outerwear suited to every climate from Antarctica to the Amazon.

New York architect Peter Gluck has just completed a 12,000-square-foot house for an Orthodox Jewish client in Brooklyn that has 10 bedrooms and baths, a "mother-in-law suite" with maid's room attached, and a kitchen with separate areas for the preparation of kosher meals. "Because of the mobility of the society we live in, people want a place where the whole family can get together, even if it's once a year," says Gluck. "They are commissioning their own resorts."

According to Stern, "Kitchens now have spaces where he cooks, she cooks, and the cook cooks. There's a pantry and a breakfast room off the kitchen. A media room. A library for reading and visiting with small groups. There's a family room where people can gather to watch a sporting event on TV. The master bedroom often has a sitting area, his-and-her baths, his-and-her dressing rooms, and a separate place to pack."

Mark Ferguson, who started Ferguson, Shamamian & Rattner in 1988 after leaving Parish-Hadley, the old-line New York decorating firm, explains that one reason these houses are so big is "the duplication of programs. The den/media room duplicates the function of the living room. Once the library may have served as an office; today, there's a separate home office. Now there's also an informal dining area and breakfast room off the kitchen. Kids don't play in bedrooms anymore but in a playroom."

Allan Greenberg says he is being asked for greenhouses, stables, home theaters, gyms, underground garages, and custom windows and ironwork. Peter Marino is designing large staff wings, separate rooms for massage, and home hair salons. Paul Fortune is building meditation rooms with tatami mats and trickling water and has had requests for helicopter landing pads.

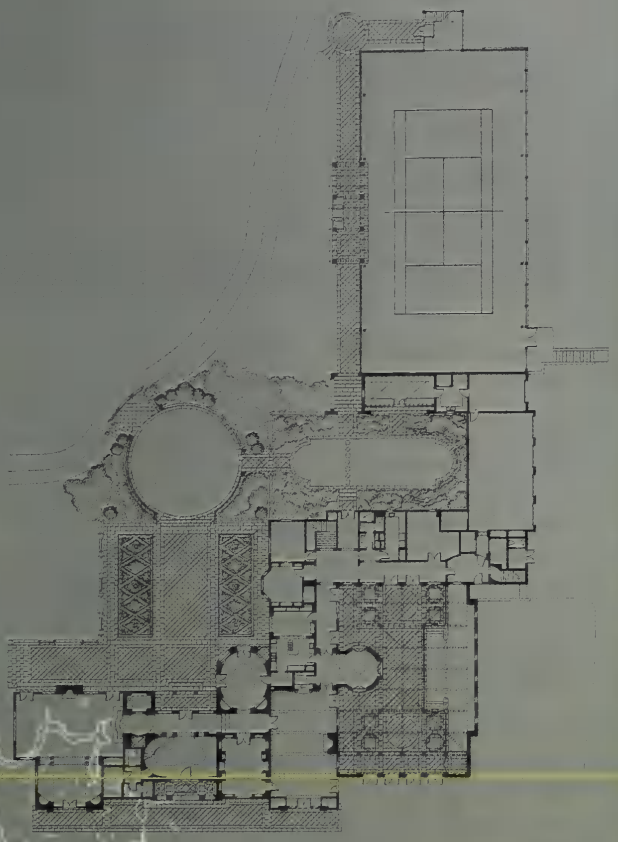
Peter Shelton says he has designed old-fashioned radiators, enormous dining rooms, multiple sets of stairs, an equipment room for sports paraphernalia, cedar closets, fur-storage rooms, wenge floors, anegré wood paneling, and caretaker's houses.

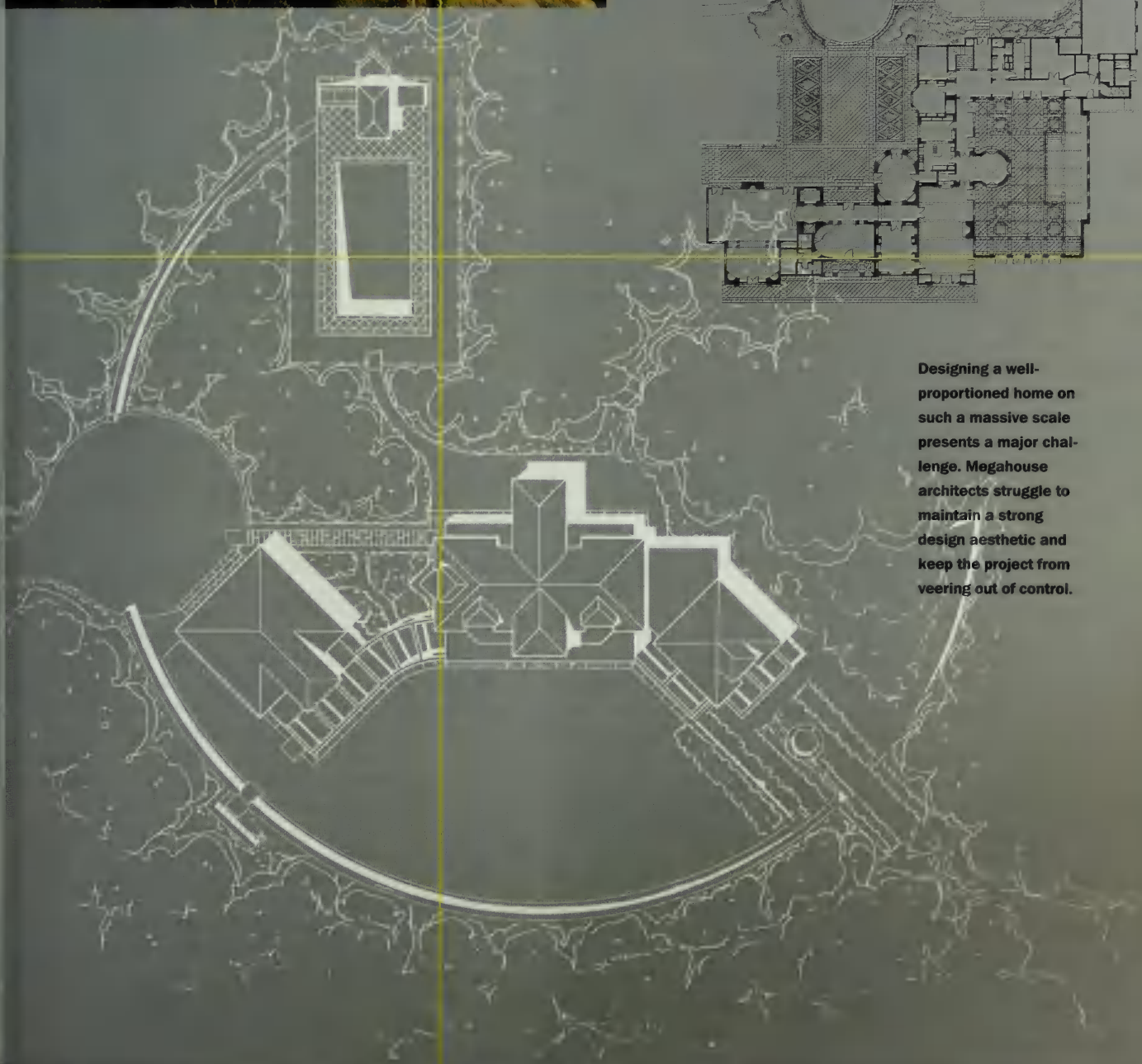
Alexander Gorlin, who is currently building a huge modern home in the Colorado wilderness, says clients are asking for moss rock, hard-wired cappuccino machines, secret passageways, roof terraces, crafts



MANY CLIENTS HAVE AN URGE TO LOOK LIKE OLD MONEY; AS A RESULT, THEY WANT HOUSES THAT HARK BACK TO EARLIER ERAS.







Designing a well-proportioned home on such a massive scale presents a major challenge. Megahouse architects struggle to maintain a strong design aesthetic and keep the project from veering out of control.



"WHAT'S GREAT IS THAT WE ARE REINVENTING THE WHEEL. EVERY ROOM IS AN OPPORTUNITY TO EXPERIMENT WITH THE FLOOR, THE CEILING, THE MATERIALS."

rooms, leather-tile floors, Australian lacewood cabinetry, pearwood kitchens, and towers over the master bedroom.

"What's great," says Francis Fleetwood, "is that we are reinventing the wheel. Every room is an opportunity to experiment with the floor, the ceiling, the materials, the window systems."

Reasoning and repercussions

Working in such a heady atmosphere can throw an architect for a loop. Budgets are no longer constrained. The tenets of Modernism and minimalism are often tossed out the window. Some designers may feel funny being part of such conspicuous consumption. But sometimes, designing megahouses offers chances to explore and experiment.

"Designing these houses does change you as an architect," says Bart Voorsanger, echoing several of his peers. "When there's no budget, there are perpetual opportunities for invention. You find varieties of stone and wood that are unique. I had a piece of glass fabricated in Florida—for a client in Montana—that is 34 feet long and 11 feet high. It cost $600,000. With big houses, you can hire top-of-the-line contractors. What's important is that things are done perfectly; the fees are irrelevant. Budgets go up to $2,000 a square foot."

Clark Stevens of RoTo Architects in Los Angeles says recent work on a large house design "taught us to improvise, because the program changed almost daily. We learned to go with the client's values, not ours. If a client wants eight lavatories for his personal rituals, you should respond. Demand that your clients teach you what will bring them joy. Ask what they like about the process."

Peter Bohlin says working with James Cutler on the Gates house changed his practice profoundly. "Both of us are noted as design architects, so it was unusual to have a true joint venture," he explains. "But we did. I was out in Washington for ten days a month for six years. It was a seamless collaboration." He continues: "We learned that working for technocrats requires a nimbleness in your response. We learned things about technology and electronics that I'm already incorporating in new projects. We were able to use extraordinary materials: Douglas fir recycled from an old warehouse, granite from the Cascades in Washington, green granite from the Adirondacks, green basalt from Mt. Baker in Washington State."

Bohlin says that by working together, the duo also "developed design strategies about structure. We set up places in the landscape that looked like they were preexisting, almost like remnants of old buildings. Making a kind of false history can be a good way to organize a big building, so you can read it in layers."

"We've had to change the way we organize the office," Don Rattner says. "We can no longer approach it on a generalist level, where each architect has a multitude of tasks to perform. Now we're more hierarchical, so we have to keep our internal communication channels very clear. When something unexpected happens on a job, there might be eight people who need to know immediately. Specialization has set in; people who are particularly good in one area, such as audiovisual, have to focus on that throughout the life of the project."

Though many architects did express consternation at being involved in Louis XIV–type extravagance, they agreed that moral qualms will only get in the way of a project. "Once you agree to work on a big house, you say goodbye to all that," says Mark Simon. Adds Ned Forrest, "If you think in terms of the life span of a house, isn't it better to do one that lasts? That's a certain kind of economy."

Jaquelin Robertson, who is also an urban planner, says, "I have a lot of moral qualms about ecological prudence, but there are things more important than the tiny percentage of big houses that are being built."

Megahouses can also cause heartache for architects, because they are often decorated in styles not suited to the architecture. Francis Fleetwood just completed a Shingle Style home on the Atlantic coast in which an interior designer injected Chinoiserie into every room. The colors are the egg-yoke yellow of Chinese glass, the red of Chinese lacquer, and the blue of Ming vases. The decor includes faux bamboo chairs, table, mirrors, and desks, chintzes with idyllic Chinese scenes, large antique hanging scrolls depicting Chinese ancestors, and Chinese Deco rugs.

The proper proportions

But interior decorating isn't the only problem. Simply designing a well-proportioned home on such a massive scale presents a major challenge. Megahouse architects struggle to maintain a strong design aesthetic and keep the project from veering out of control.

"Big houses are the hardest to do, to keep the scale domestic," says Hugh Newell Jacobsen, an architect based in Washington, D.C. "Proportions are like a well-mannered lady who never shouts at the neighbors. For me, an ideal ceiling height is 17.5 feet. I like the minimal look with lots of light. No moldings. No trim. I make houses where people are more important than the furniture."

"Size matters," notes Stern, in the inevitable *Godzilla* joke. "It's not the number of rooms or overall size of the house that's important, but the size of the rooms and closets and hallways. It's the leftover spaces."

"The hardest part of doing a big house is to keep it proportioned properly," agrees Mark Simon. "With a very large house, I often can break it into pieces so it becomes more like a village."

"Bigger is not always better," says Mark Hutker. "We tell clients to stay under 7,000 square feet so the houses fit in the landscape." "Big houses are tough," acknowledges Robertson, "but they are just like every other house. Scale is everything."

"It's about the hierarchy of spaces," says Meier. "The important thing is the quality of human scale. It doesn't matter how big a room is if you feel comfortable there. You have to think about the scale of the spaces. That's the art in it."

(continued on page 201)

"I'd like all wood, inside and out."



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"OK."

"Maybe some sidelights."



"OK."

"You know, a different design for the panes might be better."



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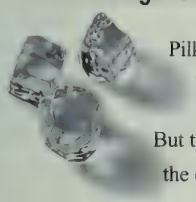
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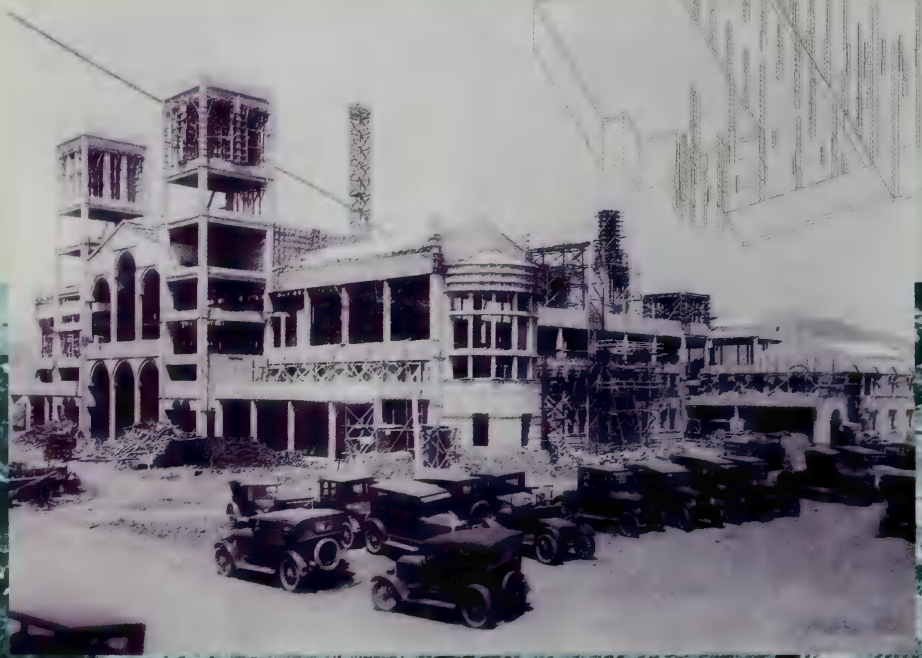
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CIRCLE 48 ON INQUIRY CARD

The sturdy concrete and masonry frame of Royce Hall (drawing) is credited with minimizing damage to the building during earthquakes.



In the late 1920s, Royce Hall was one of the first buildings on the new UCLA campus.

PROJECT DIARY After earthquakes wracked its iconic towers, UCLA's ROYCE HALL is restored and, in the process, redefined.



"The world is a progressively realized community of interpretation," says the inscription over one of the entries to Royce Hall, a building named for the quotation's author, the California-born, early 20th-century philosopher Josiah Royce. While Royce's words may make him sound like a deconstructionist before his time, his observation holds true of the building that bears his name. From the time the building's doors opened in 1929 on the University of California at Los Angeles campus in Westwood, Royce Hall has been the school's symbol; the university logo is an abstraction of the main facade, with its three round arches flanked by a pair of towers. Reinterpreted several times in the seven decades of its history, Royce Hall was never more radically altered than during a $68.8 million renovation that began, unexpectedly, with a 1994 earthquake. The ironic result of that reinterpretation is a building whose mass more closely matches its Lombard Romanesque architectural expression than ever before, says design architect Barton E. Phelps, FAIA. That's thanks, in part, to the distinctly non-Lombard Romanesque addition of 25.5 million pounds of concrete and 1.8 million pounds of rebar.

by Thomas Hine

1926-1929

The founders of UCLA conceived of a university that would recall the dawning days of the Renaissance in the German-influenced towns of Northern Italy. One of the first four buildings on the campus was the 200,000-square-foot Royce Hall, a concrete frame building that, despite its picturesquely irregular appearance, was organized in a basically symmetrical Beaux-Arts parti and cloaked with brick and terra-cotta. Structurally it followed what was then the common approach to earthquake safety: good craftsmanship and sturdiness.

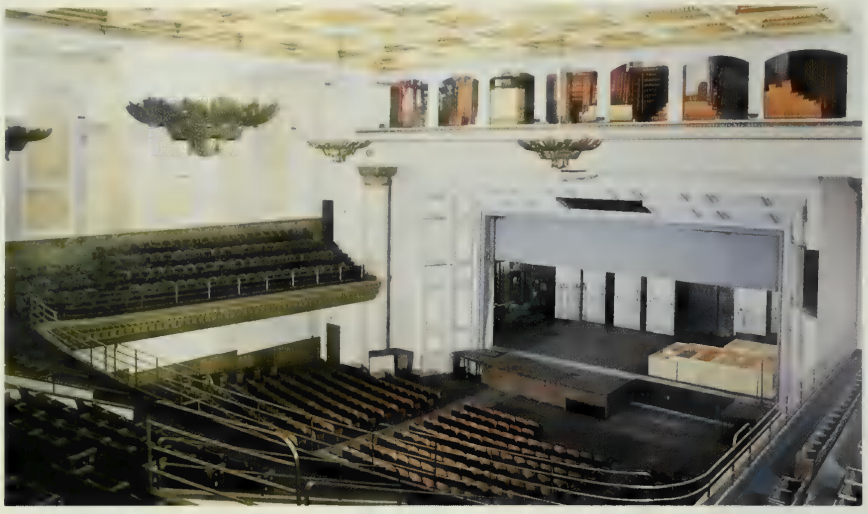
The principal elevation is a loose interpretation of the 12th-century Church of San Ambrogio in Milan, Italy, while the other elevations, with their multiple levels and varied ornamentation, are designed to look as if they had been built in increments. The west front, atop a slope, evokes an Italian hill town. Though the Lombard Romanesque style that had been chosen for the new university was thought to be more appropriate to its setting than a Gothic style, early photographs show Royce rising incongruously from the empty, semiarid landscape of the rancho that had been acquired to house the university.

Royce Hall served originally as the university's main classroom and academic building and housed the auditorium, which was its only large indoor assembly space. Its exterior contains a virtual sample book of Romanesque decorative motifs. The painted ceilings of the loggia that runs along its front facade evoke great thinkers from Archimedes to Einstein; the latter eventually paid a visit. The ambitions of UCLA's founders were expressed in the auditorium lobby, decorated with cast concrete coats of arms of the most ancient universities of Europe.

When Royce Hall was first constructed, its architects, the Los Angeles firm Allison and Allison, seem to have run out of energy or, more likely, money by the time they got to the interior. The grandest gesture

Project: *Royce Hall, University of California, Los Angeles*
Architect: *Anshen + Allen Los Angeles—Tom Chessum, AIA, principal-in-charge; Antoinette Bunkley, project manager; Jorge de la Cal, Anthony Moretti, AIA, technical advisors*
Design architect: *Barton Phelps & Associates—Barton Phelps, FAIA, principal architect; Markku Kari, project architect; David Haggerty, Jeanette Fabry, Celia Miller, Ron Calvo, design team*
Interior designer: *Audrey Alberts Design, Tina Beebe (color)*
Engineers: *John A. Martin & Associates, Inc. (structural); Kim Casey & Harase, Inc. (mechanical and electrical)*
Consultants: *Neal Matsuno and Joe Kaplan (lighting); McKay Conant Brook, Inc. (acoustics); Tatanya M. Thompson & Associates, Inc. (painting conservator); Melvyn Green & Associates, Inc. (building preservation)*
General contractor: *Morley Construction Co.*

Thomas Hine is a freelance writer and former architecture critic for the Philadelphia Inquirer. *He is currently working on a book entitled* The Rise and Fall of the American Teenager *(Avon, forthcoming).*



The original auditorium (below) included clerestory and stained-glass windows. By the time the 1984 renovation was completed (left), the windows had ben covered up. At that time the hall was also made accessible.



was the ornate coffered auditorium ceiling, based on the one in Rome's Church of Santa Maria Maggiore, built during the 15th century. There were also stained-glass windows in staircases and others in the auditorium (later removed), and some ornamental ceilings in which concrete beams were painted to imitate timbers.

"This was by and large a state school building of 1929," says UCLA's campus architect, Charles W. Oakley. "There were a few attempts at decoration, but everything was pretty simple."

When the building opened, the auditorium was large enough to hold all of UCLA's students. It was conceived primarily as a ceremonial and assembly space. One year later, an organ was installed, which launched the auditorium's transformation from a collegiate space into a center for musical and theatrical performances. During the 1930s, it emerged as the chief performing venue for the west side of Los Angeles.

1978-1984

By the late 1970s, Royce Hall was an important center for the performing arts. However, the auditorium was sorely in need of an update. In 1978, the university commissioned a design for functional, aesthetic, and acoustical improvements, as well as a seismic reinforcement of the building's outer walls; many of the university's buildings were to receive a seismic retrofit at the same time. John A. Martin & Associates, the structural engineers who performed the seismic investigation, saw that Royce's frame and infill structure were poorly adapted to earthquakes. However, when it came time to fund the project, no money was available for the seismic work. Instead, renovation efforts were concentrated on the auditorium.

Oakley worked on that design as project architect for John Carl Warnecke and Associates, architects for the renovation. Also involved were acoustician Ronald McKay of McKay, Conant Brook Inc., and Martin & Associates. The work, completed in time for Royce to serve as an important venue for the arts festival that accompanied the 1984 Olympic Games, addressed issues of accessibility, provided additional lobby space, and created a pleasant roof terrace.

By this time, the classroom function of the building had diminished in favor of departmental and faculty offices. These departments had, over the years, modified their spaces to suit their needs and desires. Phelps likens the building to a village in which different families have coexisted, each on its own turf, since time immemorial.

1994

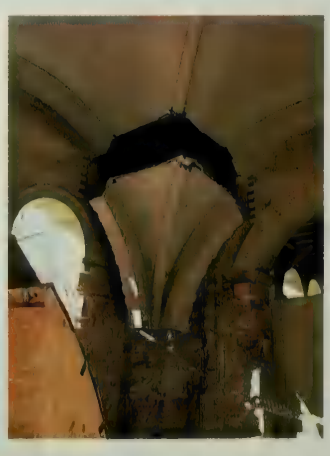
Then one morning, it looked as if this symbolically potent building might fall down. At 4:31 a.m. on January 17, 1994, Royce Hall—and the whole Los Angeles area—was shaken by the 6.8 magnitude Northridge earthquake. This quake, the most economically devastating in American history, damaged thousands of buildings, including many on the UCLA campus.

Oakley, who was by then the campus architect, recalls standing later that morning with Charles E. Young, then UCLA's chancellor, looking at some foreboding cracks that had appeared on the sides of the towers. Royce Hall was a problem, though fortunately not a ruin. Then a major aftershock shook the ground again. "It was easy to imagine those towers falling into the quadrangle," Oakley recalls, "and I believe the chancellor had much the same thought." The landmark building had become a potential disaster. Immediately, Royce Hall and its quadrangle were closed, and the building was girdled with 12-by-12 lumber to stave off further damage.

A subsequent survey of the structure indicated that the precautions taken were warranted. Indeed, while the towers had twisted in the quake and posed the biggest immediate danger, the entire building was in trouble. The classroom and office wings were pulling away from the taller 1,800-seat auditorium that occupies the building's center. Much of the structure's integrity was lost.

Ironically, Royce had been the next major building in line for a seismic overhaul—the one it never received in the mid-'70s—but the earthquake made the building's precariousness an emergency. "Young didn't want to have Royce Hall fall down during his watch as chancellor," Oakley says. "I didn't want to have Royce fall down during my watch as campus architect. The University of California regents didn't want to have Royce fall down during their watch."

Barton Phelps was standing on the lawn that January



Removing the corners of the vaulted ceilings beneath the towers provided access to supporting piers.

SEISMIC RENOVATION IS AT THE HEART OF THE ROYCE HALL PROJECT

How do you seismically upgrade a building without making it look seismically upgraded? That question dominated the restoration of Royce Hall. "The structural system was preeminent. It was designed first, it went in first," says design architect Barton E. Phelps, FAIA. During the course of the four-year project, a seismic frame, including reinforcing steel and concrete, shear walls, and drag beams, was implanted in the structure.

A study by structural engineer John A. Martin & Associates revealed that Royce Hall took a pounding from lateral ground acceleration and also, possibly, from vertical motion. Exterior cracking and spalling were matched by cracks in veneers and infills. Royce Hall was completed before there was any clear theoretical approach to lateral resistance. Only after the Long Beach, California, earthquake, which killed 115 people in 1933, did the state develop its first seismic code. Royce's survival was likely due to its old-fashioned craftsmanship. "Nobody could understand why the building hadn't fallen down altogether," Phelps says.

The original building was extremely well constructed, with a sound concrete frame and high-quality masonry. A combination of concrete columns and beams supporting reinforced-concrete floor slabs and joists, plus the mass of the hall's nonstructural masonry infill, provided the strength to ride out the quake without collapsing.

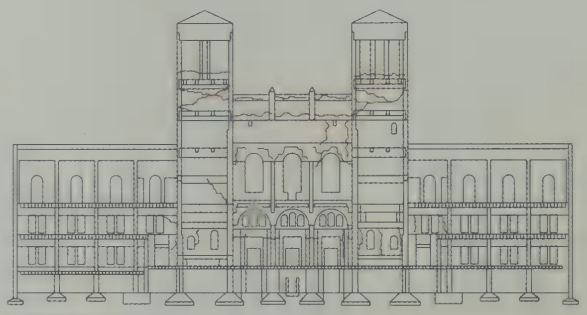
Now the design team faced a formidable task. First priority was saving Royce's 114-foot-tall towers. Torsional seismic forces nearly severed the towers' concrete columns at roof level, threatening them with collapse. Contractors removed, fixed, and replaced broken or displaced masonry and terra-cotta, then added a new concrete shear wall and frame structure.

Once the towers were stabilized, work began on the rest of the structure. Royce's high profile and historic significance demanded a structural system that would protect occupants and save the building in case of another disaster. The building's shape, a rectangular box surrounded by four wings of varying heights, was problematic. A system had to be contrived that would tie Royce Hall together so it would respond to a quake as a unit, instead of as parts. The key to developing this system was computer modeling, which simulated the building's performance under an earthquake's forces.

The result is a seismic system made up of 22 reinforced shotcrete shear walls distributed throughout the building. Steel dowels attach the shear walls to the original walls, though some of the shear walls are freestanding. About 650 linear feet of five-by-six-foot grade beams tie the new walls and existing columns. Drag and bond beams also help tie new and old walls.

Access to the site was challenging. Intricate sequencing was required to remove debris and bring in new materials through an extremely narrow passage. All work had to be be done by hand, from demolition to installing shotcrete and rebar. Each new shear wall and beam presented a unique situation, sometimes requiring slabs and beams to be shored before a new wall's slot could be cut, and other times requiring existing beams to be drilled so reinforcing steel for a new wall could be placed. *Paul Rosta*

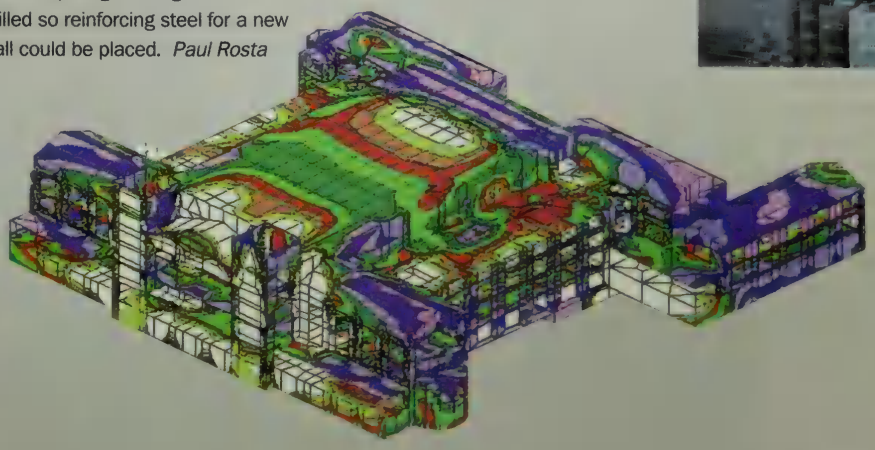




DAMAGE ANALYSIS



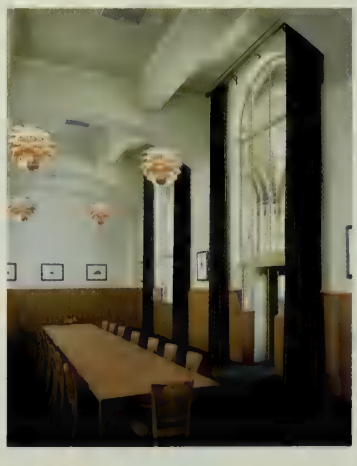
The towers were first stabilized (top). Then cracks were carefully mapped (above), while computer modeling examined how Royce Hall would respond to seismic forces (below). Building components were recorded before work began (right).



morning as well. His office had been hired to work with Martin & Associates to renovate the two towers. Their report on the building's condition was a week away from completion, and what had happened in the quake didn't really surprise them. Both Phelps and Oakley recall that the engineers seemed pleased, gleeful even, that the building had failed just as they had predicted.

It was quickly apparent that while the reinforcement of the towers should go ahead, the project would ultimately need to involve the building as a whole—and a much larger budget. Oakley believed that Phelps's office was too small to handle a project of that size, so he asked Phelps to put together a team that would have "institutional credibility." Anshen + Allen in Los Angeles came on as executive architect, while Barton Phelps & Associates became associate architect for design. Similarly, Morley Construction, which was finishing work on the campus's Powell Library, moved across the quadrangle to begin emergency work on Royce. This emergency team stayed together until the end, as investigation, design, and construction proceeded, often simultaneously.

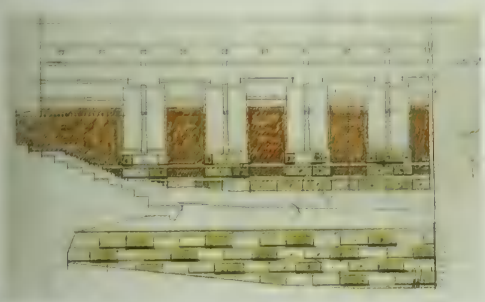
While the earthquake didn't really change what needed to be done in the towers, it did change how it had to be done. One important reason was that the Federal Emergency Management Agency (FEMA) was to be involved. The university administration actually decided to go ahead with work on Royce before there was any commitment from FEMA, although they were fairly certain federal funding would be provided. The expectation that the agency would pay most of the cost of the renovation shaped the way it was done.

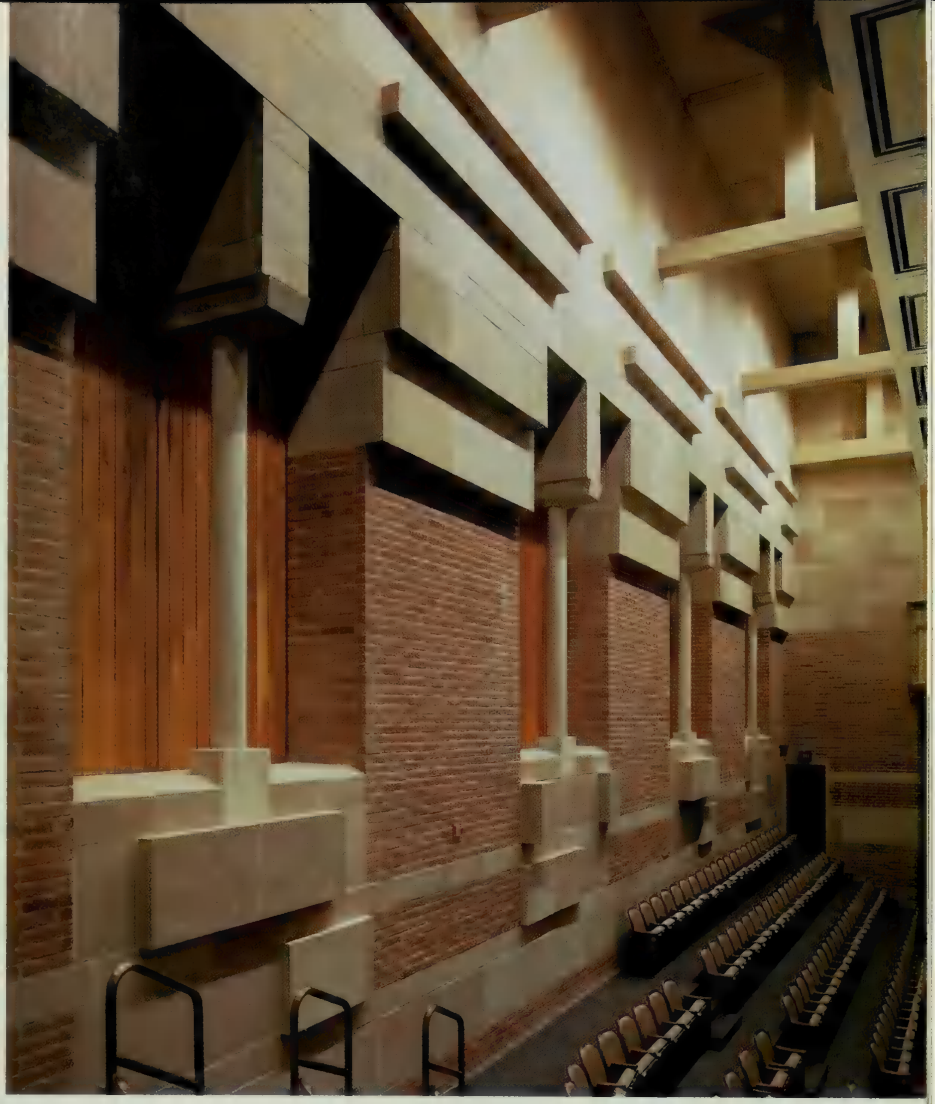


"This was a process nobody wanted, a project manager's nightmare," Oakley says, reflecting on how emergency work preceded an organized approach. "We were building before we even had a program."

FEMA's involvement meant that this would be more than a standard seismic adaptation, which seeks to assure that a building's occupants will survive a quake and be able to leave the building safely. FEMA seeks assurance that the building itself will survive. FEMA money also triggered the Section 106 historic preservation review process. The agency's policy discourages improvements; it demands that the building be put back together as close to the way it was before as structural changes and code compliance allow.

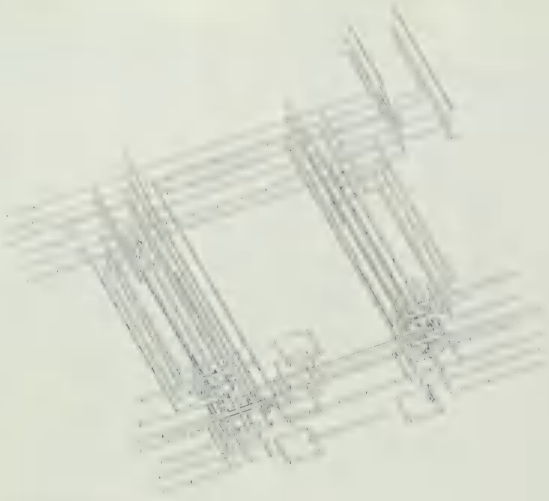
The auditorium's decorative interior belies the massive shear walls and acoustical elements added to the hall (opposite top). The renovated conference room, formerly the German department's exclusive turf, has become the best place on campus to stage a protest (opposite bottom).



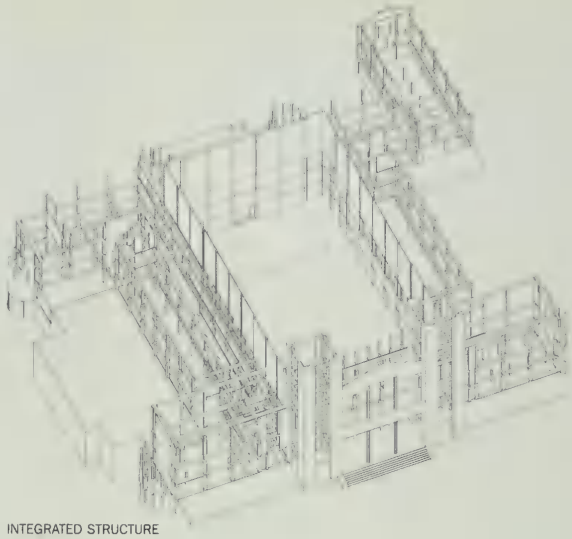




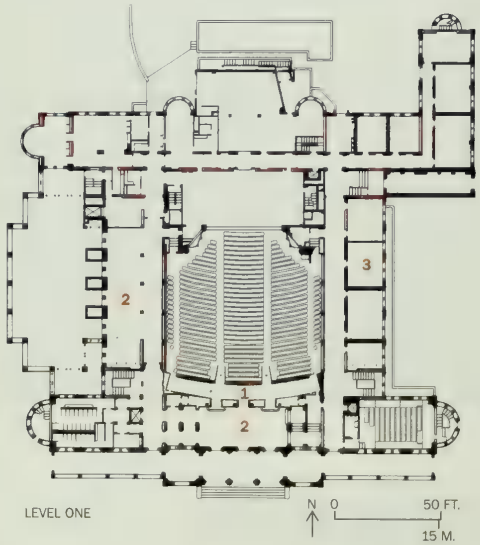
Cutting into the shear walls was one way to improve the acoustics of the auditorium. Adjustable panels (above, drawing above left) are opened or closed according to the type of performance. The coffered, ornamental ceiling appears to be suspended above the hall (left). The frame conceals ventilation openings.



HORIZONTAL SEISMIC ELEMENTS

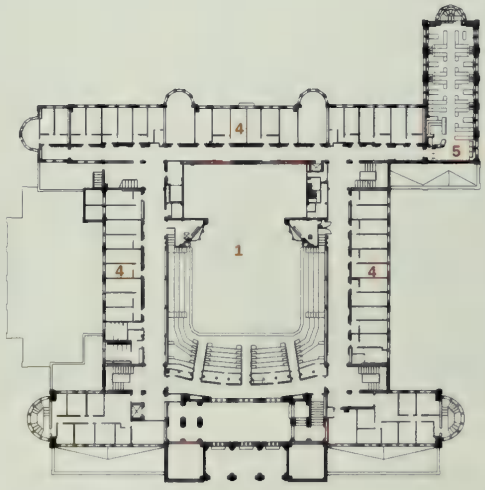


INTEGRATED STRUCTURE



LEVEL ONE

1. *Auditorium*
2. *Lobby*
3. *Classroom*
4. *Office*
5. *Library*



LEVEL TWO

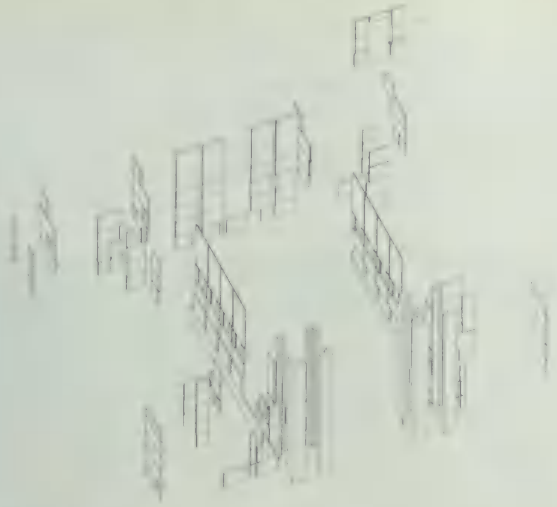
The difficulty of complying with these requirements became clear as the tower project got under way in earnest in the spring. The towers straddle a loggia that runs across the front of the building. As a result, it wasn't possible to strengthen the piers at the towers' base without disturbing the ceilings of this loggia. These appear to be painted vaults but are actually plaster ceilings on iron frames, which are suspended on wire from the floor above.

Unlike the vaulted ceilings across the entranceway, these ceilings, beneath the towers, were not particularly spectacular. There was a temptation to destroy them and re-create them later. However, the ceilings were part of the building's historic fabric; destroying them would have jeopardized the federal aid.

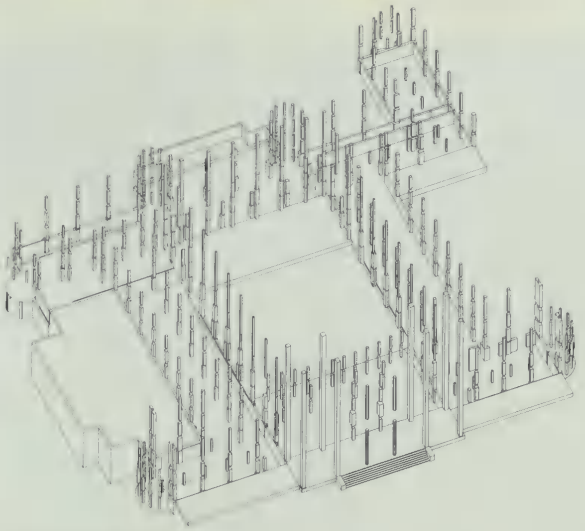
To preserve the ceilings, the contractors cut a hole in the floor above and workmen were lowered into the cavity to add reinforcing materials to the iron frame. Then cradles were built to hold the corners of the ceiling vaults, which were cut out and stored. The centers of the ceilings were still in place. All this made it possible to remove the brick veneer behind the piers and add concrete. Each of the bricks was then replaced in its original location (inadvertently restoring some graffiti scrawled long ago by former students) and the ceiling corners were put back in place and secured.

The project demanded intense concentration. Architects and engineers were usually on site consulting with the workmen, occasionally drawing design details on the wall, which were duly signed and photographed to become part of the documentation of the building.

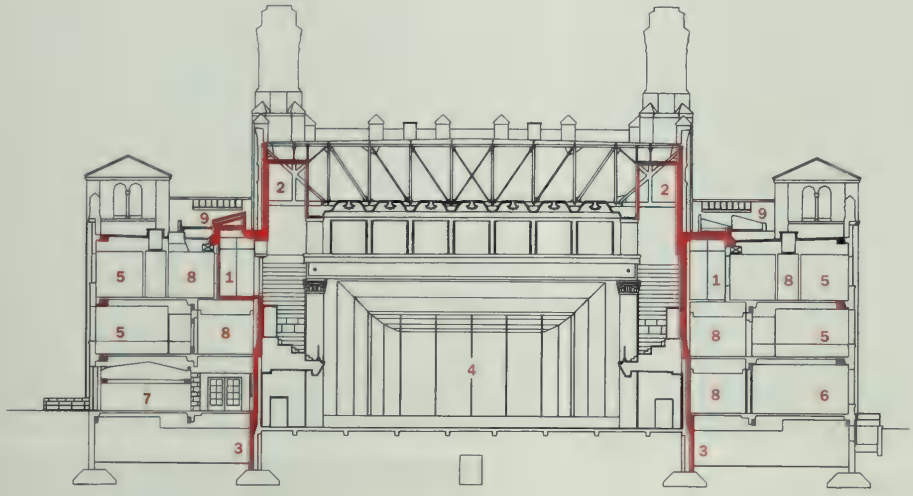
"This was, in a sense, the key moment of the project," says Tom Chessum, project director for Anshen + Allen. While other parts of the tower project, such as building the structure from the top while utility conduits were removed below, involved a lot more work, preserving the ceilings had great symbolic importance, Chessum says, giving builders and designers alike confidence in their own resourcefulness and a sense that care would be rewarded.



VERTICAL SEISMIC ELEMENTS

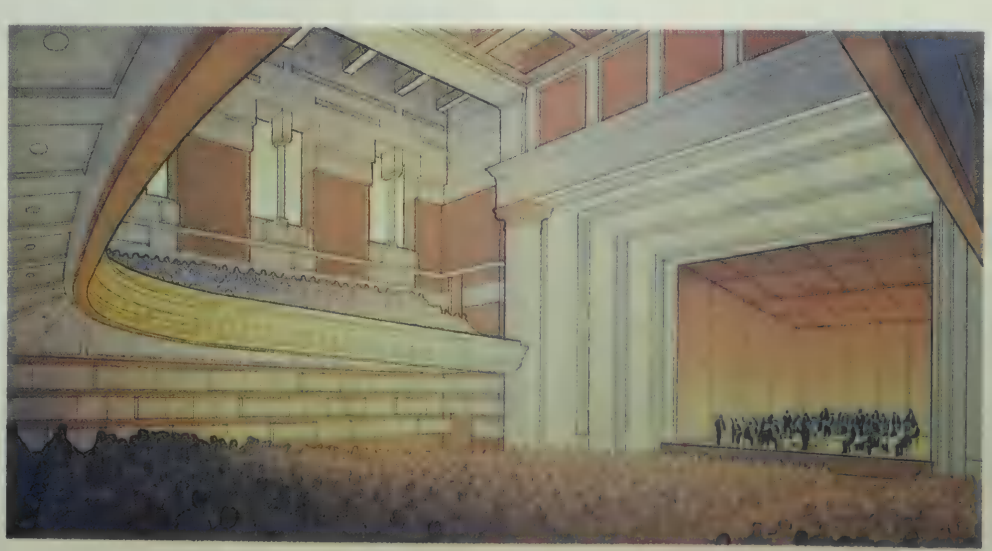


PRE-EXISTING STRUCTURE



TRANSVERSE SECTION

1. *Acoustical gallery*
2. *Acoustical cove*
3. *Seismic-resisting frame*
4. *Stage*
5. *Offices*
6. *Classrooms*
7. *West lobby*
8. *Corridor*
9. *Skylights*



About a year after the quake, the iconic towers were stabilized. But integrating seismic features into the auditorium was crucial to the building's strength. That process necessitated rebuilding portions of the auditorium (left). The resulting hall is acoustically superior to the original and even more appropriate to the building's Lombard Romanesque style.

1995-1998 Fifteen months after the quake, work on the towers was complete. "The problem was they really weren't connected to anything else in the building," says Phelps. "If there had been another earthquake, the towers might have fallen down together." Only after the entire building was updated and unified would the structure be truly safe.

The fundamental strategy was to strengthen the walls of the auditorium, the five-story void at the center of the plan, off of which all the other pieces of the building hang. Essentially this meant putting a new building inside the old one. As Gordon Bradley, who ran the job on site for Morley Construction, expressed it, "We had to put 10 pounds of stuff in a five-pound bag."

Despite the sentiment in favor of putting Royce back the way it was before the earthquake, the logic of the project was pushing in another direction. "This began as, first and foremost, a structural project," says Chessum. "But the structural approach created an architectural logic that led to something that nobody could have predicted."

FEMA was ultimately to pay about $50 to $55 million for the construction costs; the balance of the funding—about $15 million—would come from university fundraising efforts. The federal agency's strict preservation requirement meant that the classroom and office corridors—the plainest parts of the building—had to be stripped of decades of ad hoc design. It was a challenge to recover the simple, dignified rhythm of arched doorways and vaulted ceilings while incorporating sprinklers, new lighting, and utilities. In the end, these embodiments of '20s pragmatism turned out to be as informative about the school's history as the more expensive eclecticism of the exterior. Many faculty offices had to be disturbed or reconfigured, however, in the process.

The biggest disturbance came at the heart of the building, the auditorium. Most of the new shear walls could be installed inconspicuously outside the walls of the auditorium. But at the upper levels, the walls had to be within the volume of the auditorium itself to prevent them from being visible and thus changing the proportions of the building's exterior. It was clear that it was going to be impossible to simply restore the auditorium to the way it was in 1984, or even to its earlier configuration. The addition of the shear walls posed an enormous change to the nature of the building. It was up to the engineers, architects, and acousticians to make a new auditorium using pieces of the old.

The loss of 7,000 cubic feet of space, taken up by the new shear walls, was sure to change the auditorium's acoustical qualities by shortening reverberation time. That would have lessened the suitability of the space for orchestral music. But even before the earthquake, while most were satisfied with Royce Hall's acoustic performance, McKay, the acoustical consultant who worked on the 1984 redesign, was not. He felt that the auditorium lacked sonic richness, especially when filled with people. It needed a longer reverberation time, not the shorter one the addition of the shear walls would cause. Better still, he argued, would be an adjustable acoustic, one that would shorten the reverberation time for the spoken word and amplified performances and lengthen it when orchestras played.

The idea of an adjustable acoustic for the hall had been rejected during the 1984 renovation, but the diversity of performances at Royce convinced McKay that the idea should be revived. In order for it to happen, though, some way would have to be found to adjust the acoustical volume of the hall.

Simultaneously, former chancellor Young was particularly drawn to the opportunity to reintroduce daylight into the auditorium. While natural light was of no interest to the Center for Performing Arts, a university-sponsored entity that produces performances on the campus and the hall's chief user, Young believed that it would enhance the auditorium's role as the symbolic center of the university and make it an even more pleasant space.

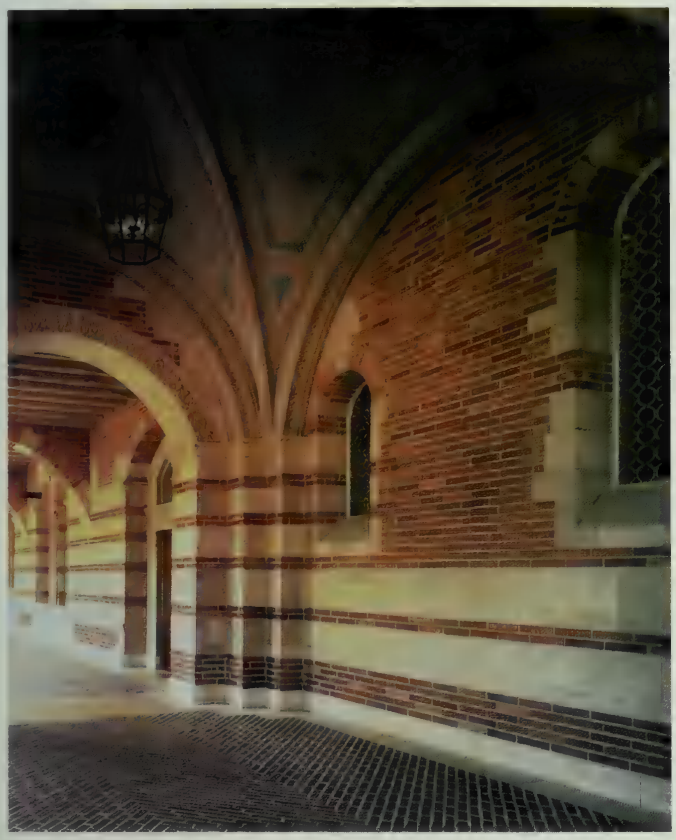
University officials and the designers had two choices: they could simply add the shear walls, or they could make radical changes that would improve the hall's acoustical quality and lighting. Oakley, one of those making the decision, faced the additional dilemma of seeing much of his own work on the 1984 renovation removed or altered. The university chose to take the bolder approach. "If Royce was going to con-

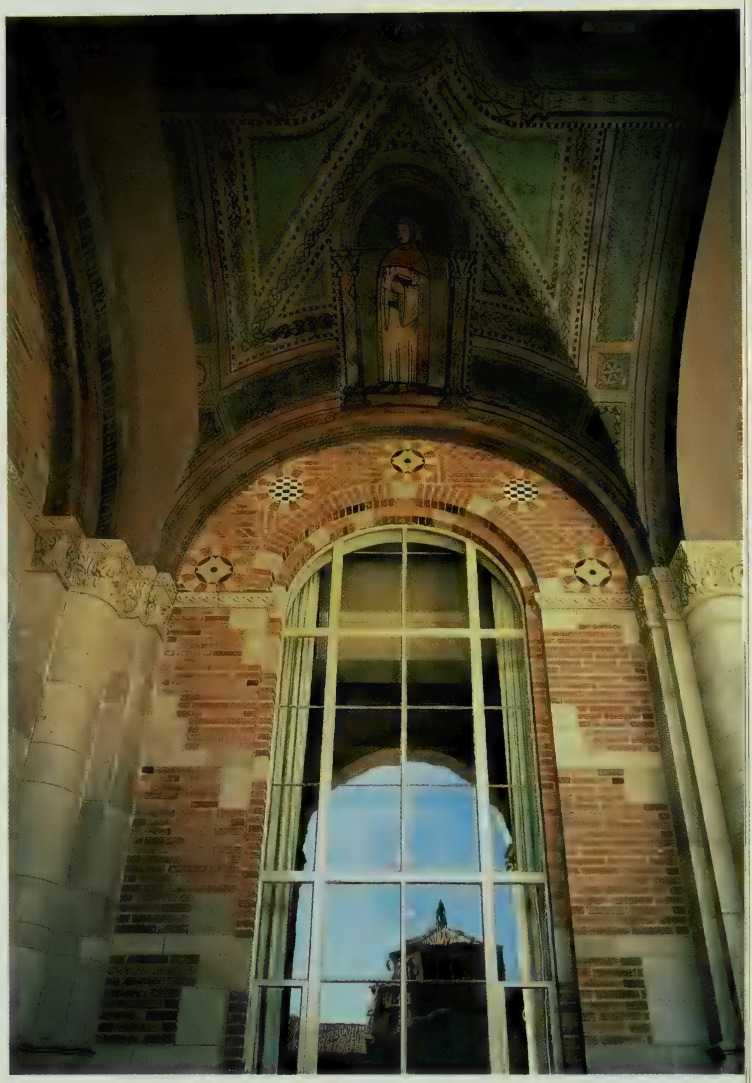
An exterior areaway was enclosed and skylights with motorized sliding covers installed (below). The covers control the amount of daylight entering the auditorium, while laminated glass limits noise. The decorative north loggia (right) has terra-cotta columns.





One of the lobby bays at the base of the towers (below). The paintings on the loggia vaults (right) are by Julian Ellsworth Garnsey, a well-known muralist from New York City. Made of canvas glued to plaster, then covered with gesso to appear old, the paintings were carefully restored.





tinue to be the major identification of UCLA for another 50 or 75 years, the building had to become more usable," Young says.

The designers devised two solutions to fulfill these needs. The first involved building a skylighted roof over what had been an exterior areaway and making large openings in the new shear walls below. This would introduce light and openness at the top of the auditorium, originally provided by the ceiling vaults and the stained-glass windows (which were blocked up and ultimately removed at some point in the building's history). By installing a series of panels to create acoustical chambers at each opening, the acoustical properties of the hall could be controlled.

The other new source of volume was created by opening some of the attic space adjacent to the coffered ceiling and exposing the ends of the original roof trusses. Because it does not touch the side or back walls, the ceiling appears as an ornamental object in the room, whose space flows upward and, indirectly, through the skylight. The hundreds of holes in the ceiling that had been used for ventilation were blocked for acoustical reasons and new overhead vents were added, as was an air-conditioning system. The vents were incorporated into what appears to be a frame around the ceiling, which further dramatizes the ceiling's separation from the architecture around it.

By changing the ceiling from an architectural enclosure to a decorative object—an effect furthered by uplights on the side walls that make the ceiling glisten—Phelps was able to realize his ambition of carrying the feeling of the exterior to the most important interior space. A Romanesque room with a Renaissance ceiling might look funny, but a Romanesque room containing a piece of Renaissance decorative art seems normal.

Since the walls were going to be rebuilt in any case, Phelps wanted to make striped walls using the same many-hued brick and terra-cotta found on the exterior. This idea became *(continued on page 199)*

Sources
Acoustical plaster: *Pyrock, Inc.*
Acoustical tile: *Armstrong*
Paints and stains: *Benjamin Moore*
Linoleum: *Marmoleum*
Wood flooring: *Junckers*
Fixed seating: *Irvin Seating*
Cherry chairs: *Thomas Moser*
Auditorium upholstery: *Unika Vaev*
Interior lighting: *Shaper, Leucos, Poulsen, Lightcontrol, Prudential, Zumtobel, Elliptipar, Engineered Lighting Products*
Downlights: *Lightolier*
Task lighting: *Alkco, Limburg Glass, Cole Lighting*
Lighting controls: *Lutron*
Elevators, lifts: *Amtech*
Terra-cotta and roofing: *Gladding McBean*

Battling the clock and taming a huge space were two of the challenges facing the architects of the new HONG KONG AIRPORT.





Built on a 3,085-acre island that was mostly reclaimed from the harbor, the Hong Kong Airport's terminal stretches more than three-quarters of a mile. Roof vaults at the entrance (opposite) cantilever nearly 90 feet to protect the vehicular drop-off.

PHOTOGRAPHY: © DENNIS GILBERT/VIEW, EXCEPT AS NOTED; MICHEL PORRO (RIGHT)

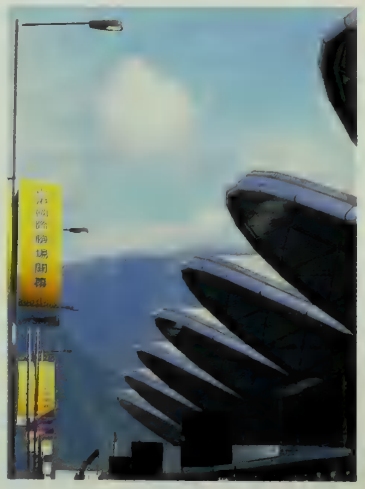
by Clifford A. Pearson

Given the job of designing the world's largest airport terminal, Foster and Partners and its colleagues in the Mott Consortium made a curious decision: they would do everything they could to remind visitors that this shimmering, barrel-vaulted machine-for-travel is one continuous volume of space. A more conventional approach might have broken down the mega into the sub, addressing the project's vast scale with a collection of different parts. But instead of dividing to conquer, the architects working on Hong Kong's new airport at Chek Lap Kok devised a strategy of winning the battle of scale by unifying everything under one roof. Interiors were kept as open as possible, level changes reduced to a minimum, and clutter eliminated.

As a result, the building unfolds as a seamless experience, a great sweeping expanse that allows travelers to see from one end of the terminal to another. And instead of intimidating the visitor, it provides clarity of movement: you know where to go because the architecture points you in the right direction and because outdoor views let you see where the planes are.

Unity of space, though, should not be confused with uniformity of experience. While the great barrel vaults establish a standard 120-foot (36-meter) grid that runs throughout the structure, the roof curves in two directions—creating lower, more intimate spaces at the north and south ends of the terminal and higher, grander volumes at the busy center. And spaces where the vaults are bundled together (such as the departures hall) are quite different in character from those at the connecting concourse, with its single overhead vault. Daylight from rows of skylights running down the center of each vault and from generously glazed curtain walls provides a warm glow to interiors whose neutral tones and elegant detailing might otherwise have come across as being too cool or institutional.

Sir Norman Foster explains the project this way: "It is a quest for calm spaces bathed in filtered natural light—views to the aircraft, the sea, and the mountains, so that you always know where you are—an uplifting experience to bring a sense of occasion to air travel."



At 5.57 million square feet, the terminal is called "the largest enclosed public space ever made." From the car and train drop-off on the east end to the 38th jetway on the west, the building stretches in a Y formation more than three-quarters of a mile (1.27 kilometers) and is covered by a 45-acre

Project: *Hong Kong International Airport, Hong Kong*
Client: *Hong Kong Airport Authority*
Design consultants: *The Mott Consortium (Foster and Partners, architects and designers; Mott Connell Ltd., engineering and project management; BAA, airport planning and operational systems)*
Architects: *Foster and Partners—Norman Foster, Ken Shuttleworth, Graham Phillips, Donald Choi, Grant Brooker, Mouzhan Majidi, Robin Partington, Winston Shu, directors; Brian Edes, Brian Timmoney, John Small, Mike Jelliffe, Richard Hawkins, project directors; Jonathan Parr, Ken Wai, Martin Riese, Paul Casey, Stephen Trstenjak, associates*

(credits continue on page 103)

roof. When the final piece of the Y is completed next year, the terminal will encompass 5.94 million square feet of space.

The new airport, which replaces close-in but cramped Kai Tak Airport, was designed to handle 35 million passengers a year, six million more than the old airport accommodated last year. Plans call for a satellite terminal to be added sometime before 2040; the entire complex would be able to handle 80 million passengers each year. The economic crisis now sweeping through Asia, though, has wreaked havoc with the Hong Kong

"IT IS A QUEST FOR CALM SPACES BATHED IN FILTERED LIGHT," SAYS SIR NORMAN FOSTER OF HIS DESIGN.

Airport Authority's projections, reducing air travel to the city by 24 percent in the first quarter of 1998. The new airport may be good architecture, but its timing couldn't be worse.

No one can accuse the British and Hong Kong authorities of being timid when they planned this airport. Indeed, the terminal is but one of 10 megaprojects conceived at the same time and now nearing completion. Called the Airport Core Program, the $20 billion undertaking includes a high-speed rail line to take people the 21 miles from Chek Lap Kok to central Hong Kong in 23 minutes, a six-lane highway following a similar route, two suspension bridges (one with a central span longer than that of the Verrazano-Narrows Bridge in New York City), a tunnel under Hong Kong's harbor, and a new town near the airport with shopping malls, schools, and housing for 20,000 residents (see Related Projects, page 102). Although the airport was the engine driving all this development, its price tag came to "just" $6.3 billion of the total.

Since large flat tracts of land don't exist in Hong Kong, engineers had to create one on which to build the airport. Originally a small island with a 330-foot-high mountain, Chek Lap Kok was leveled to a uniform height of 21 feet and expanded to four times its natural size. Constructing the 3.72-by-2.17-mile island required nearly half the world's dredging fleet, notes Hong Kong's Airport Authority. And because the island then had no land connections to the rest of Hong Kong, all materials, equipment, and workers had to be transported by boat. At its peak, construction of the airport involved a workforce of 21,000 on site.

As if its vast size weren't enough to boggle the mind, the airport was built with extraordinary speed—a little more than six years from the start of design to the completion of construction. In March 1992, the architectural commission was awarded to the Mott Consortium, comprising Foster and Partners, BAA, and Mott Connell (a Hong Kong company formed by the British firm Mott MacDonald and the Australian firm Connell Wagner). Among many consultants, Ove Arup and Partners was brought in to engineer the terminal's vaulted roof. The design of the airport—from parking, air conditioning, and security all the way to graphics and platform screens for subway trains—required more than 30,000 drawings but was done in just 21 months.

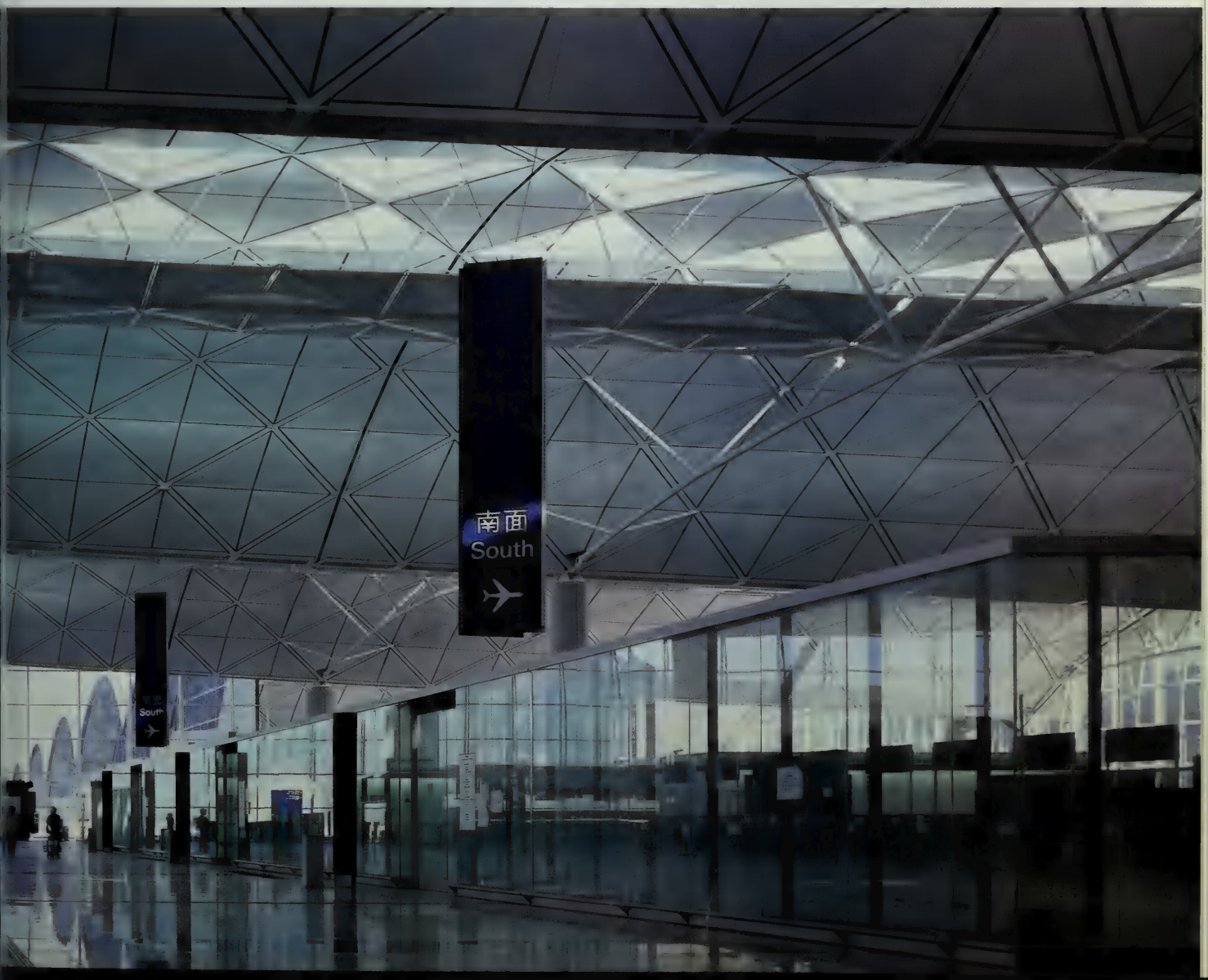
Making this speed possible was an integrated team of 230 people (including 72 architects) assembled by the Mott Consortium all in one office, explains Winston Shu, a director of Foster and Partners who is based in Hong Kong and has been involved in the project since its start. Directly above the designers' offices in central Hong Kong were the offices of the Airport Authority, which made communicating with and getting approvals from the client much faster, says Shu. Unix workstations and,

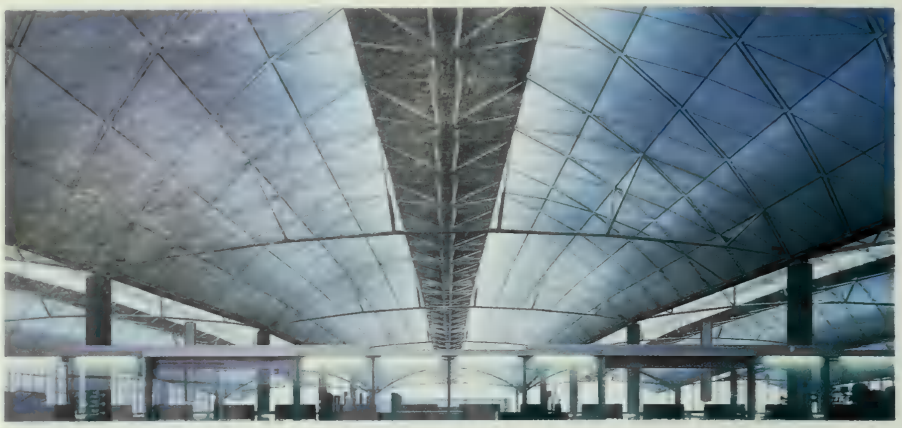
WWW On the Web *Take a virtual tour of this project at www.archrecord.com.*

Departing passengers enter the terminal and cross the atrium over one of the slender post-tensioned bridges (right and page 96, bottom), which span 140 feet. To reduce energy consumption, cold air is emitted from access points integrated into the check-in islands (far left in photo below) and stand-alone floor units, which keeps only the lower portion of the vast space cool.

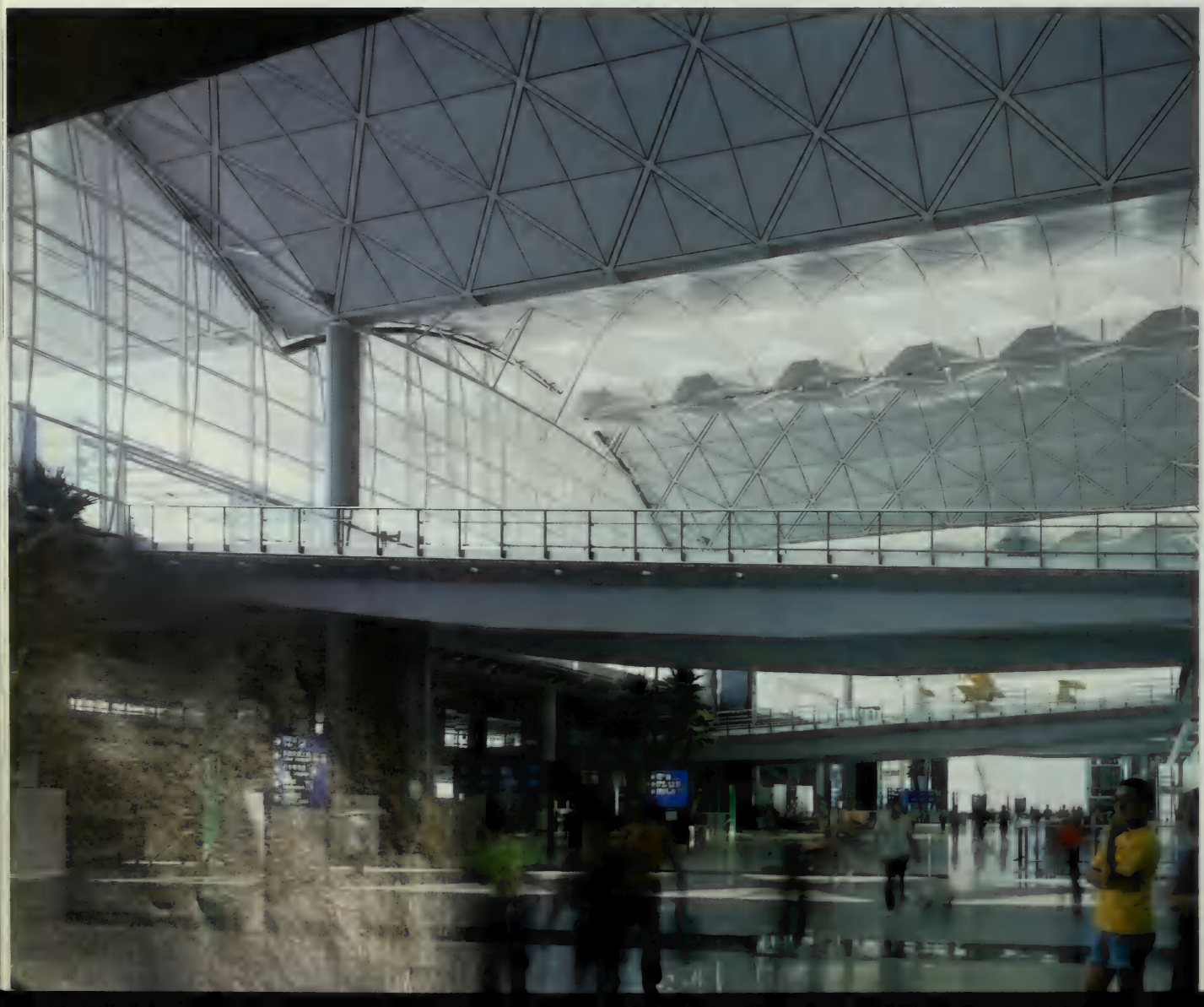



B
C
B


南面
South



The terminal's barrel vaults end in curtain walls in which large expanses of clear glass are supported at 10-foot intervals by tall bowstring trusses (opposite). Daylight from skylights is reflected from suspended gantries so it washes over the vaults (left). The "meeters and greeters" hall (below) offers a sense of arrival to passengers after they've passed through customs.





later, PCs running Windows NT and MicroStation provided a common computer platform, allowing the design team, consultants, and contractors spread over three continents to exchange information rapidly.

Another critical factor in speeding up the design process was the expertise that Foster had developed while designing Stansted Airport in London, which was completed in 1991. "Stansted gave us a 10-year period to study airports and learn how they work. So when we got the commission to work on Hong Kong, we already had done much of the necessary research," Shu explains. From Stansted, Foster learned how to develop a standard module and grid that could be applied to nearly every part of an airport, as well as how to integrate climate-control services, baggage handling, and transportation below the main concourse so the areas where passengers spend the most time are open, uncluttered spaces. The architects also borrowed from Stansted the idea of using a lightweight roof that allows sunlight to filter in from above, says Mouzhan Majidi, another Hong Kong–based Foster director. "At Stansted the roof is a series of domes that curve in two directions. Here at Hong Kong the roof is comprised of linear vaults," explains Majidi.

Working with a master plan by the Greiner-Maunsell Consortium, which included Hellmuth, Obata + Kassabaum and Ng Chun Man & Associates, the architects of the Hong Kong airport inherited a Y-shaped footprint for the terminal. "Our concept was to take the planners' original scheme, which was a series of events, and bring it all together into a unified experience," says Grant Brooker, another key Foster director.

All of the project's architecture grew out of a 120-foot (36-meter) module devised to accommodate one check-in counter. (It also fits one baggage-handling unit and 1.5 baggage-claim carousels.) Everything from the size of roof vaults to the spacing of support columns, air-handling units, and fire stairs was based on this dimension. Such standardization was essential to keeping costs and construction time down. It also served to hold all of the different design elements together. As Shu explains, "We needed to find an architectural vocabulary that would unify all of the pieces."

While the roof vaults are lightweight-steel lattices fabricated in modules and then lowered in place, most of the terminal is a poured-concrete structure. Lower floors have columns on a 40-foot grid, while

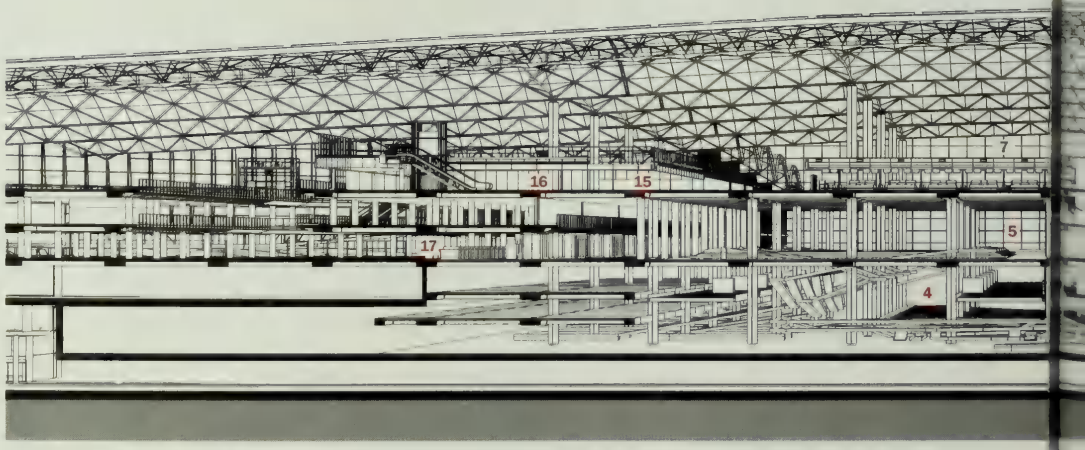
VIEWS THROUGH THE TERMINAL AND OUTDOORS HELP ORIENT TRAVELERS.

columns on the more public upper floors are 120 feet on-center. To bring daylight and views into the building, the perimeter curtain wall of the terminal is clear glass rising at least 13 feet and supported on the interior by vertical bow trusses. A special armature connects the roof and curtain wall, allowing each to move independently of the other.

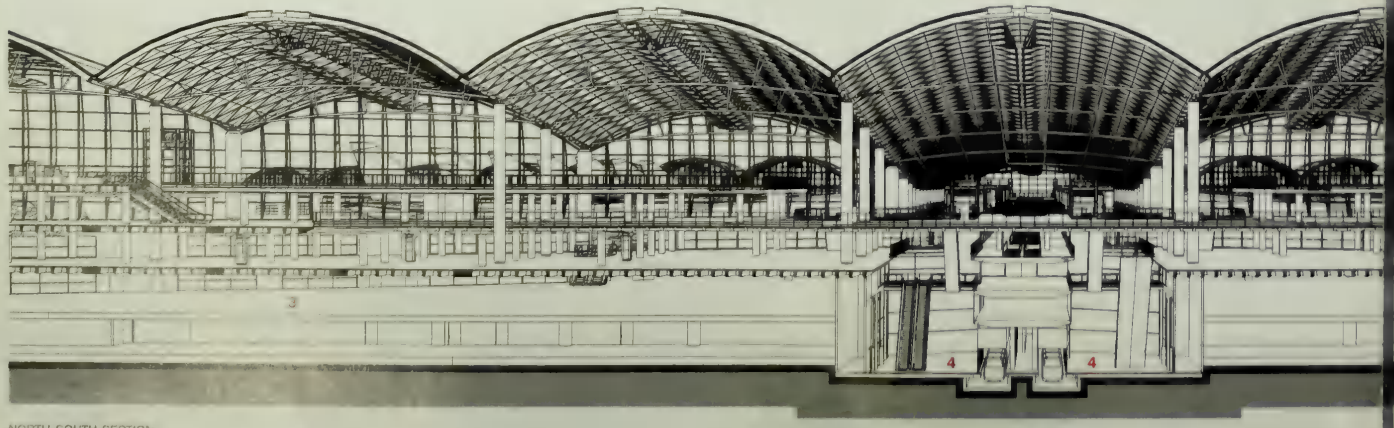
An essential element in creating a seamless experience for travelers is limiting changes in level. Indeed, arriving passengers can stay on one floor, from getting off the plane to stepping onto a train that will take them into town. Departing passengers change levels only once, going down one floor after passing through security. *(text continues)*

The 5.57-million-square-foot terminal is twice as large as Renzo Piano's building at Kansai Airport in Japan and covers an area about the size of London's Soho district. The baggage-handling hall alone is as large as Yankee Stadium in New York. The enormous size of the terminal was dictated by the fact that nearly half the world's population lives within five hours flying time of Hong Kong.

1. *Departures level*
2. *Arrivals level*
3. *Baggage hall and plant*
4. *Automated people mover*
5. *Baggage claim*
6. *Customs*
7. *Check-in hall*
8. *Meeters and greeters hall*
9. *Staff entrance*
10. *Departures road*
11. *Ground Transportation Building*
12. *Departures train from HK*
13. *Arrivals train to HK*
14. *Arrivals cars/buses to HK*
15. *Immigration and security*
16. *Retail and restaurants*
17. *Arrivals immigration*
18. *Departures mezzanine*



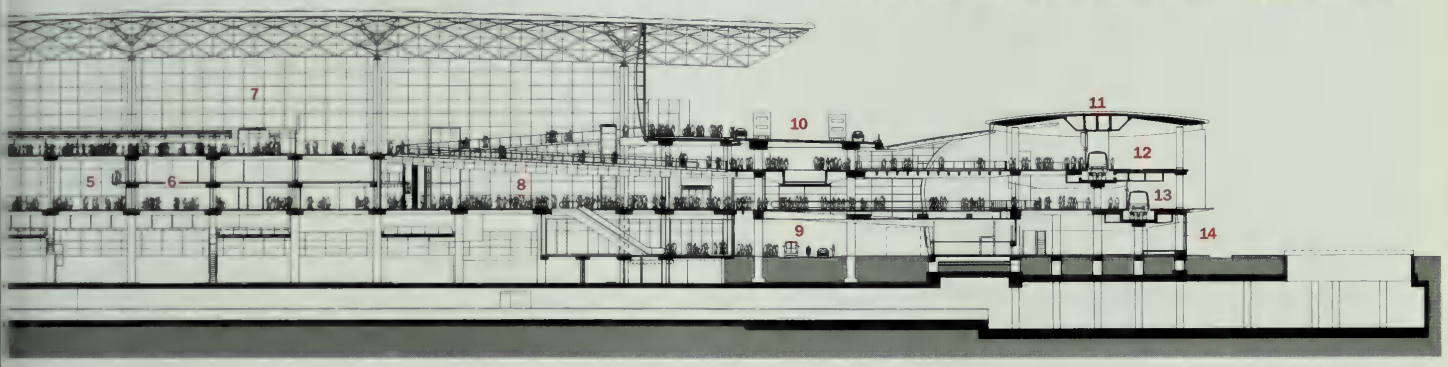
EAST-WEST SECTION LOOKING NORTH



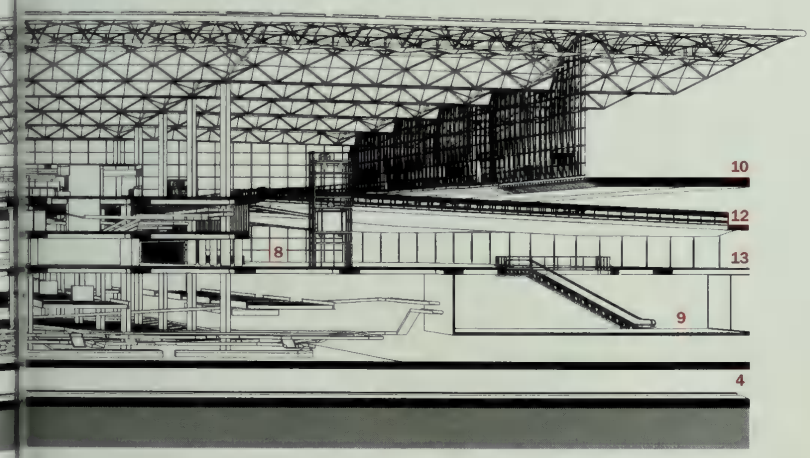
NORTH-SOUTH SECTION

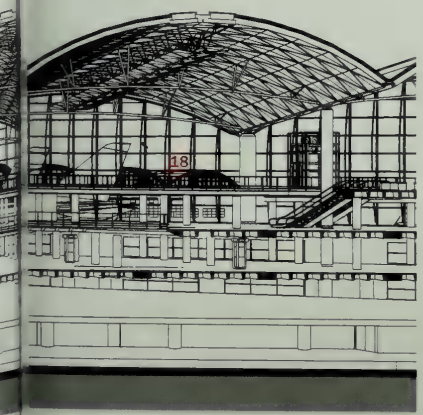
The Ground Transportation Building (right), which sits across a roadway from the terminal, provides access to rapid-transit lines, buses, and cars.

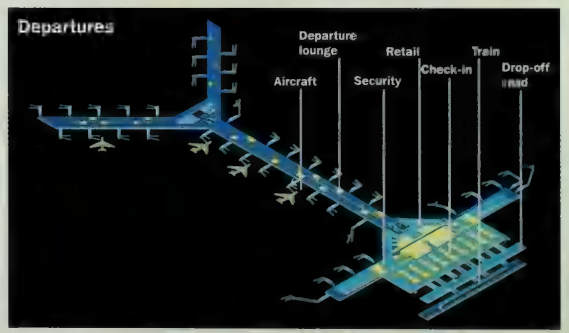


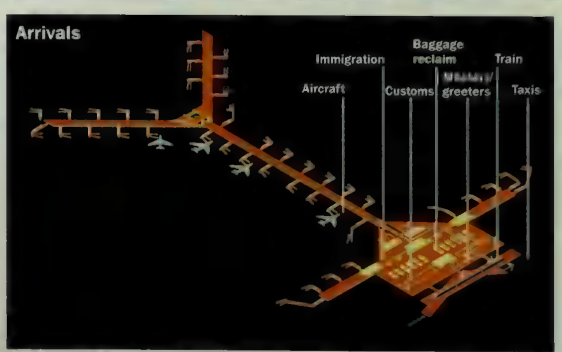


ST-WEST SECTION









The terminal separates departures, arrivals, and baggage handling onto different floors, so travelers need to make few, if any, level changes. To get to and from the far gates, though, passengers take shuttle trains on the lowest level.

LIGHTWEIGHT STEEL ROOF ALMOST SEEMS TO TAKE OFF

The sweeping multivaulted roof that is the terminal's most distinctive feature is an intriguing combination of variable geometry and standardized parts. Engineered by Ove Arup and Partners, the roof springs in a series of parallel steel-frame vaults across the 120-foot (36-meter) column grid, gently swooping from a height of 40 feet above the entrance on the east, up to 73 feet over the check-in counters in the center of the building, and down to 13 feet at the far gates to the west.

Although the roof curves from north to south as well as from east to west, it consists of 120-by-120-foot steel modules made of interlinked diagonal universal beams, all of which are straight. The 129 different modules, which weigh only 132 tons each, were assembled on a different part of the site, painted, and then lifted into place using two of the world's largest mobile cranes. With an interior clad in triangular white perforated aluminum panels and skylights making up 5 percent of the terminal building's area, the lightness of the roof pervades and unifies the vast spaces.

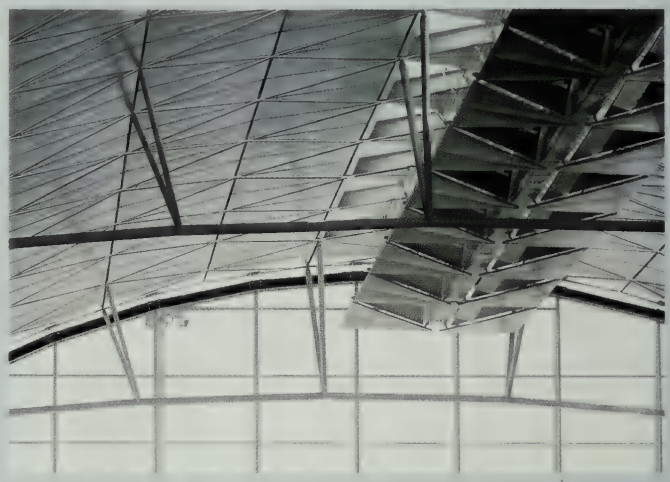
For the engineering team, led by David Scott of Ove Arup, flexibility was key for both the roof's structure and the construction options given to the contractor. Running east to west, the roof is composed of four 1,188-foot-long sections with three movement joints. But the 2,244-foot width has no movement joints, as the vaults themselves are designed to flex.

The vault structure was designed so it could be built year round, with or without the cladding, and by either bolting or welding the joints. While most of the roof is fully welded, the last arm of the Y-shaped plan, constructed after the airport opened, is bolted. The exterior cladding is a single-membrane PVC over thermal and acoustic insulators and decking laid parallel to the vault.

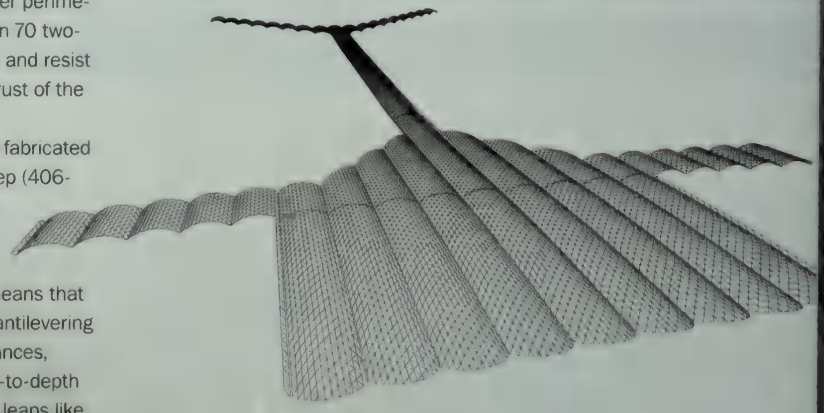
The support structure for the cladding is connected to the roof on a 10-foot grid by a special armature consisting of a spherical bearing that slides along a stainless-steel pole. At the curtain wall, the armature runs parallel to the roof and attaches to the window mullions. This system allows the roof to move completely independently of the wall, by as much as four inches both vertically and horizontally.

The roof frame is connected to the cast-in-place concrete columns by steel head nodes that allow each vault to be cranked at a slightly different angle, creating the roof's gently sloping curves in two directions. The geometry is different at each column; the contractor, given a choice of casting or fabricating the head nodes, opted to fabricate them. The column sizes range from slender central supports, 92 feet tall and four feet in diameter, which provide only vertical support and are restrained horizontally by the roof, to the 10.5-foot corner perimeter columns, which contain 70 two-inch steel reinforcing bars and resist the outward spreading thrust of the roof.

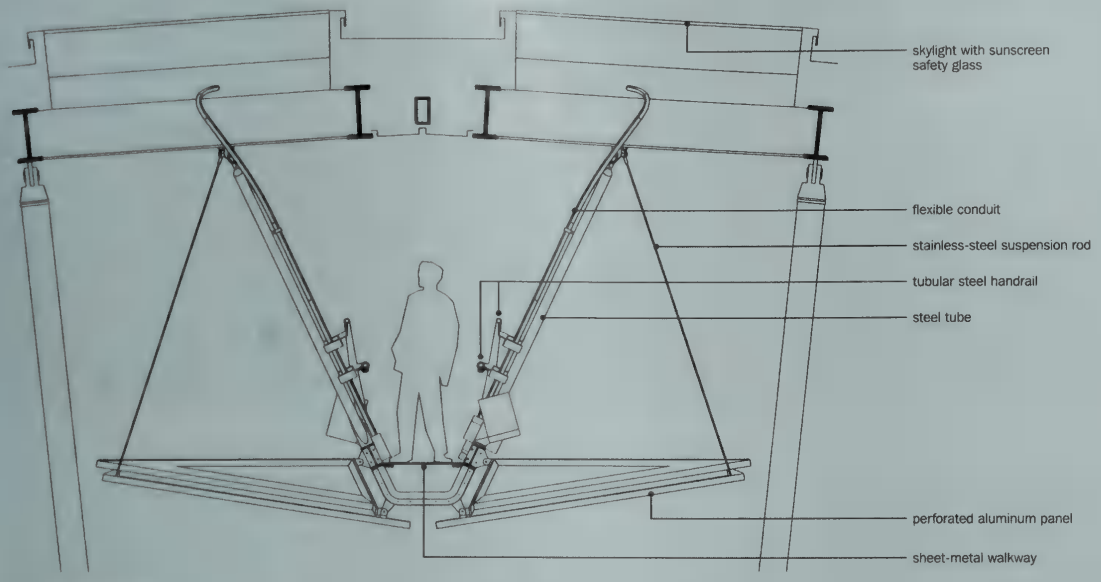
Most of the roof was fabricated with standard 16-inch-deep (406-millimeter) I-beams, the lightest standard section that could handle the buckling loads. This means that the vaults, dramatically cantilevering 90 feet out over the entrances, achieve an amazing span-to-depth aspect ratio of 88:1. With leaps like that, it's no wonder the roof seems to almost take off. *Jack Robbins in Hong Kong*



Daylight comes through triangular skylights running down the center of each vault and is reflected back up along the ceiling so it doesn't create glare (above). The gantry that bounces daylight up to the ceiling also carries light fixtures and a catwalk for maintenance personnel (drawing, opposite top).

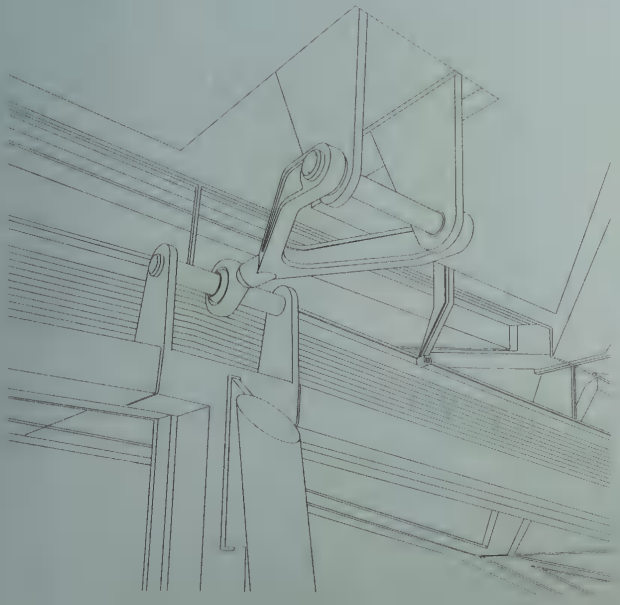


ROOF VAULTS

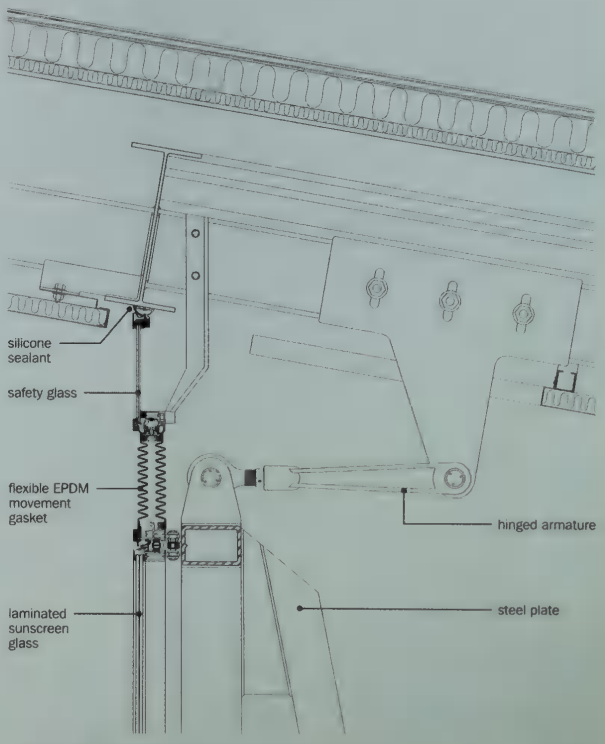


CEILING GANTRY

A special 29-pound, 22-inch-wide armature (below) connects the roof to the wall and allows each to move independently.



ARMATURE DETAIL



VERTICAL SECTION THROUGH WEST-FACING WALL

0 1 FT. .3 M.

RELATED PROJECTS LINK AIRPORT TO THE REST OF HONG KONG

As an example of integrated urban development, the Airport Core Program has few peers anywhere in the world. Funded by a combination of bonds, government expenditures, and fees paid by private companies for the right to develop different pieces of the giant puzzle, the $20 billion undertaking comprises 10 connected projects, including the new airport, a high-speed rail line linking the airport to downtown, a six-lane highway, two suspension bridges, a tunnel under Victoria Harbor, and a new town named Tung Chung.

By selling development rights to build huge commercial and residential complexes around the four stations along the new mass-transit route to the airport, Hong Kong has reaped some of the higher real estate values it created by building the new infrastructure. This scheme also concentrates new offices and housing at transit nodes, allowing most workers and residents to commute by train. As a result, the program makes sense financially and urbanistically. Its impact on the environment, however, is a controversial subject, especially since it involved several huge land-reclamation efforts.

The two downtown terminals on the new rail line, Kowloon and Hong Kong stations, serve as multinodal hubs connecting rail, bus, and tram systems. They also act as in-town extensions of the airport itself, providing ticketing and check-in services for airline passengers. Kowloon Station (opposite top), designed by Terry Farrell & Partners, is a 1.87 million-square-foot complex that will be connected to future commercial property development. On the other side of Victoria Harbor, Hong Kong Station (opposite bottom), designed by Arup Associates in association with Rocco Design Partners, sits on an eight-acre landfill site that will also be surrounded by future commercial towers.



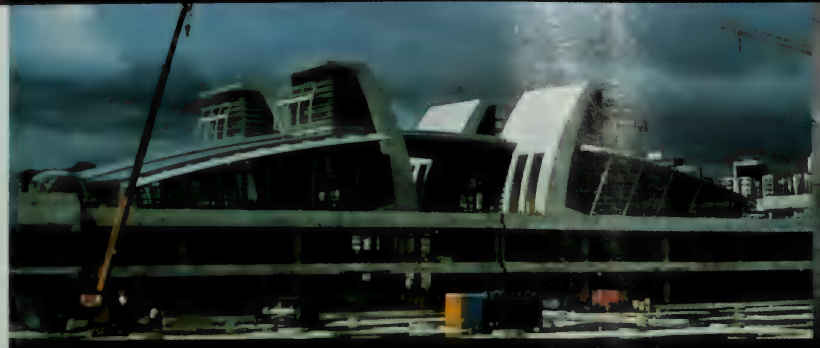
The airport at Chek Lap Kok (1) is just one part of a coordinated program of infrastructure projects that includes the new town of Tung Chung (2), an expressway, and a rapid-transit line with downtown stations at Kowloon (3) and Hong Kong Island (4). The old airport was at Kai Tak (5).

Just across a narrow channel from Chek Lap Kok, the new town of Tung Chung is rising on Lantau Island (below). Master planned by Anthony Ng Architects, the 56-acre development is Hong Kong's ninth new town (most of the others are in the area known as the New Territories). Ng also designed two of the first three phases of buildings in Tung Chung, including a crescent of housing towers rising 32 to 38 stories and a mixed-use town center that will include shops, offices, and a hotel. People who work at the new airport will find Tung Chung a convenient place to live, but planners expect even people who work elsewhere to be attracted to the great views of the water. *C.A.P.*

TUNG CHUNG NEW TOWN Anthony Ng Architects (master plan and some architecture). Plans call for 10.5 million square feet of development, including 12,500 apartments, 605,000 square feet of retail, 235,000 square feet of hotel, and 162,000 square feet of offices. Some apartment towers are already completed.

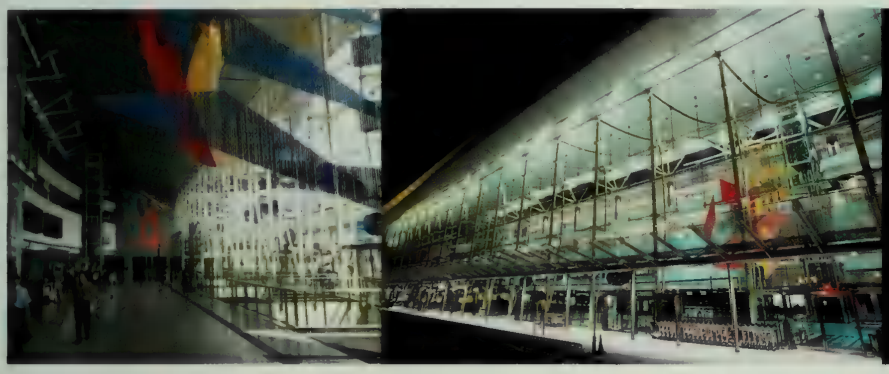








KOWLOON STATION Terry Farrell & Partners (architects). The largest complex on the new airport rail line, this station provides access to three different rail lines, as well as buses and other ground transportation. A concourse links all the various elements and an atrium connects with nearby commercial projects.



HONG KONG STATION Arup Associates and Rocco Design Partners (architects). The end of the airport rail line, this station connects with other rapid-transit lines and ground transportation, and features a shop-lined atrium.

(Travelers going to or from one of the far gates, though, will probably take the automated people mover, a train on the lowest level. Or they can use the moving sidewalks running the length of the connecting concourse.)

One of the most memorable spaces in the terminal is the grand departure hall, which is nine bays (1,073 feet) wide and rises to a height of 73 feet at its center. After checking in and going through passport control

THE GOAL WAS TO DEVISE AN ARCHITECTURAL VOCABULARY TO UNIFY ALL PARTS OF THE TERMINAL.

and security, travelers go down one level and find the largest single retail area in any international airport.

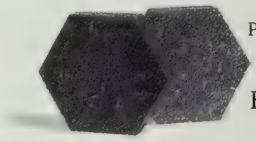
Although the departures level offers the best views of the terminal's dramatic roof vaults, light wells running down the center of the connecting concourse offer glimpses of the roof to passengers on the arrivals level as well. And when arriving passengers get through customs they are treated to a "meeters and greeters" hall that spans nine bays and is completely open to the roof above. The last stop for travelers arriving in Hong Kong is the Ground Transportation Building, a long tubular structure that accommodates trains, buses, and cars on various levels.

"The airport had to be the gateway to Hong Kong," states Douglas Oakervee, the project director for the Airport Authority of Hong Kong. "I think we've achieved that with a building that's as spectacular as the city itself." ■

Engineer: *Ove Arup and Partners (structural)*
Consultants: *WT Partnership (cost); Fisher Marantz Renfro Stone Architectural Lighting Design (lighting); O'Brien-Kreizberg and Associates (construction programming); Wilbur Smith Associates (traffic planning)*
Master planner: *Greiner-Maunsell Consortium (a joint venture between Greiner International Ltd. and Maunsell Consultants Asia Ltd.) in association with Hellmuth, Obata + Kassabaum International, Ng Chun Man & Associates, Maunsell Geotechnical Services Ltd., J. Roger Preston & Partners, CES Consultants (Asia) Ltd., Balfours International (Asia) Ltd., Widnell, Coopers & Lybrand Associates Ltd., Flight Transportation Associates, KPMG Peat Marwick, The MVA Consultancy, Lea+Elliott Inc., Avsec Inc., TRA*
Main contractor: *BCJ Joint Venture (Amec International Construction Ltd., Balfour Beatty Ltd., China State Construction Engineering Corp., Kumagai [HK] Ltd., Maeda Corp.)*
Other contractors: *AEH Joint Venture (terminal building services); New HK Airport People Mover System Joint Venture (automated people mover system); Swire Engineering Services Ltd. (baggage-handling system); Gammon Nishimatsu Joint Venture (terminal building foundations); GEC (HK) Ltd. (flight-information display system)*

Sources
Roof steel, link bridge, structural steelwork: *Watson Nippon Steel Joint Venture*
Lighting: *Thorn Lighting*
Indirect lighting: *SPI Lighting*
Internal cladding: *Permasteelisa*
Expansion joints: *C/S Group*
Elevators: *Ryoden Lift & Escalator Co.*
Escalators, moving walkways: *CNIM*
Seating: *Wilkhaln, Wilkening & Hahne GmbH*

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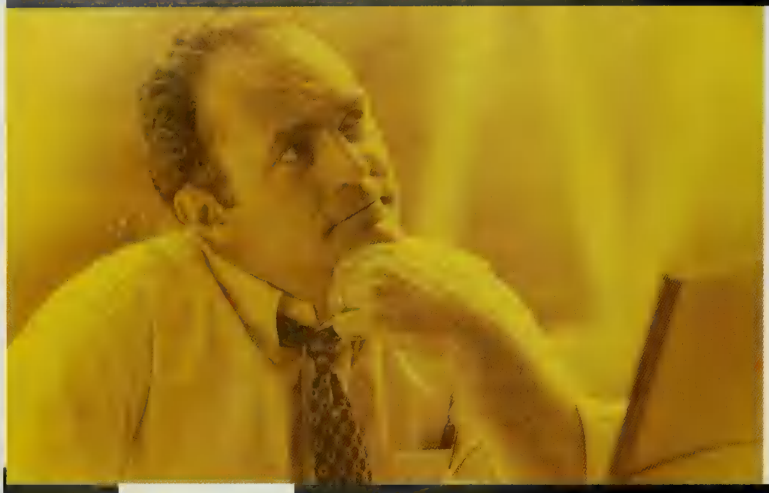
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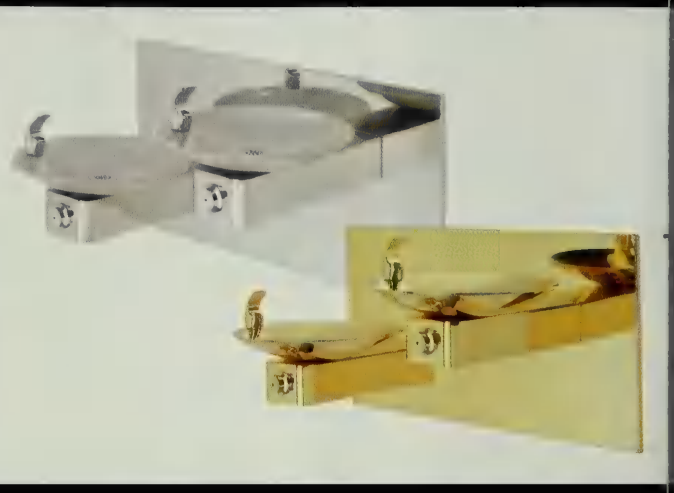
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RESORT HOTELS

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RESORTS NEED MORE THAN NICE ROOMS TO SUCCEED; DEVELOPERS TODAY CAPITALIZE ON OUR DESIRE FOR ENTERTAINMENT, EDUCATION, AND PAMPERING.

by Véronique Vienne



1

San Pedro, Chile

Challenged by intense light and some of the driest conditions on earth, Germán del Sol created the rugged but luxurious Hotel Explora in Atacama.



2

Cabo San Lucas, Mexico

Working with local materials, plants, and craftspeople, the developers of Las Ventanas accentuated the pleasures of Baja's environment and traditions.



3

Braga, Portugal

Beginning with the skeleton of an 18th-century Cistercian monastery, Eduardo Souto de Moura crafted the spare but welcoming Pousada de Santa Maria.



4

Bali, Indonesia

At the Four Seasons Resort at Sayan, a large main building and 28 individual villas step down the terraced slopes of a Balinese river valley.

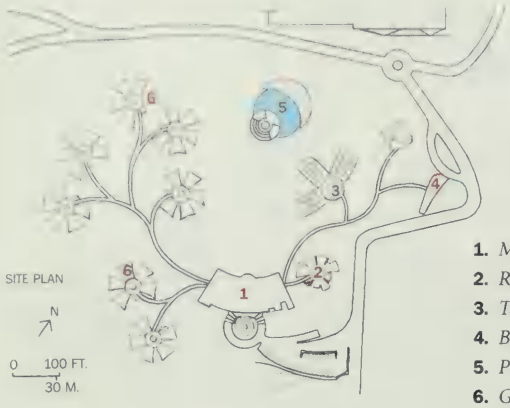
Think of the number four. Add 12 zeros to it. Then put a dollar sign in front. That's the size of our wanderlust: four trillion dollars, the amount we spend each year on tourism. And our leisure time and our appetite for travel continue to grow, the latter at a rate of some 15 percent a year.

With numbers like these, you'd think that globetrotting is second nature to human beings—especially to Americans, whose thirst for travel is legendary. But while Americans are today among the biggest spenders in nonbusiness travel (the 80 million U.S. citizens who went on vacation in 1997 spent an average of $350 a day), they used to be homebodies, frittering away their leisure time on their front porch. At the beginning of the century, while wealthy Europeans indulged in month-long water cures at resort spas, Americans seldom took time off to get away, even for health reasons. Back then, taking it easy was frowned upon.

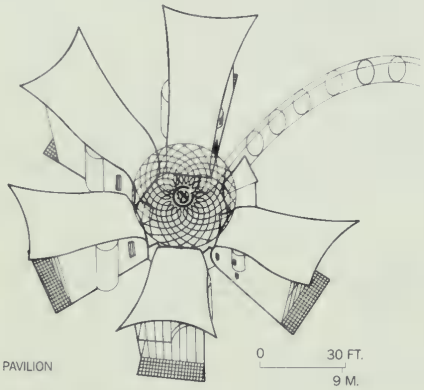
Everything changed about a century ago, when trolley companies on the East Coast created amusement parks at the end of their lines to boost their weekend business. The recreation facilities were located as far as possible from urban centers, to force people to buy round-trip tickets. Called "trolley parks," these primitive venues featured landscaped walkways, swing sets, picnic groves, refreshment stands, and gazebos. Palisades Park, at the end of New Jersey's Bergen County Traction Company line, opened to the public in 1898—an early blueprint for many resorts to come.

Old photographs of the Palisades Park swimming pool, complete with an artificial sand beach, deserted island, and waterfall, look strangely familiar today. The Victorian architecture of the bathhouses, with their latticework and gingerbread trim, inaugurated a style now associated with grand hotels and resorts. Even the bathing beauties, in their swimming caps and belted tank suits, look surprisingly modern. If these were color images rather than grainy black-and-white photographs, you might squint and think you were looking at the Renaissance Resort in Goa, India (minus the palm trees), or Disney's Grand Floridian Beach Resort (minus the monorail)—both themed resorts designed in the last decade by Wimberly Allison Tong & Goo (WATG), the world's leading design consultancy for hospitality, leisure, and entertainment.

Véronique Vienne, a freelance writer who lives in Brooklyn, New York, is the author of The Art of Doing Nothing: Simple Ways to Make Time for Yourself *(Clarkson Potter, 1998).*



1. *Main building*
2. *Restaurant/shops*
3. *Tennis courts*
4. *Business center*
5. *Pool*
6. *Guest suites*



Heydar Ghiai & Sons' high-security resorts are designed as a series of pavilions to ensure guests' privacy.

Designing the experience

Though much more imposing than their trolley-park ancestors, today's resort environments still attempt to attract customers to the end of the line. When guests get to their final destination, whether it is a palace hotel in Ka'upuhelu or a bed-and-breakfast in Kansas, they want to feel like they've *arrived*. They want to put down their baggage and exhale.

Resort architects have to be sensualists as much as builders—their work is not a success unless guests sigh and say, "It doesn't get any better than this." Yann Leroy, of Brennan Beer Gorman (BBG), a New York–based architectural firm known for its resorts and casinos, explains, "You should not see the architecture. You should experience the place, the landscape, the details, the atmosphere." The most critical challenge for architects is understanding what guests expect in terms of relaxation, escape, novelty, and enrichment. Howard Wolff, spokesperson for WATG, puts it bluntly: "The realization of these expectations is what sells hotel rooms and dining seats."

Today, though, regardless of how many of its guest rooms or restaurant chairs are occupied, a stand-alone hotel will have trouble surviving if it's not part of a larger complex. For that reason, there's a growing trend toward mixed-use resorts that combine recreation, retail, time-share, and spa facilities. Mark Hornberger, of the San Francisco architecture firm Hornberger + Worstell, notes that his clients are realizing that resorts with a residential real estate element can be very lucrative. "Time-shares are the fastest-growing trend in resort architecture," he says. Developers leverage the uniqueness of their resort to enhance the value of the land around it. Some analysts even argue that hospitality design is a subset of the real estate business, not the tourist industry.

This makes sense. Unlike the traditional hotel industry, which caters to travelers in transit, the resort business is all about keeping people in one location. Creating a sense of place—and selling it—is what resort development is all about.

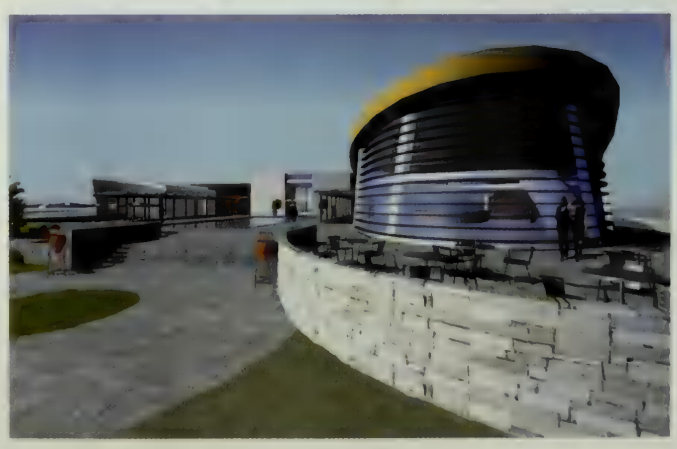
No one does this better than Hong Kong developer Amanresorts Ltd. Its luxury hotels—with names like Amankila, Amandari, Amanusa, Amanpuri, Amanjiwo—are known the world over for the exquisite level of their services and amenities. But some of its competitors speculate that the lavish properties don't break even and suspect the company is capitalizing on the reputation of its resorts to build a real estate empire. Established in 1988, Amanresorts has certainly built an empire—in the resort-going public's consciousness, at least. The company's Bali and Thailand properties in particular have established a standard by which all other luxury "lifestyle resorts" are judged, always receiving the highest ratings on *Condé Nast Traveler*'s Gold List.

The big theme: theming

But real estate booms don't last forever, and speculating on them does not appeal to everyone. For many resort architects, what supports their business is theming. "Everything seems to be themed these days," says Wolff. "Themed resorts. Themed restaurants. Themed retail. Even cultural institutions such as museums are looking toward theming to attract more people, keep them happy, and bring them back." After the success, in 1992, of their Palace of the Lost City, a 350-room South African resort built around a fictional lost kingdom, and of the Palace of the Golden Horse, a 500-room, five-star fantasy resort in Malaysia, WATG recently re-created the sunken world of Atlantis in Paradise Island, Bahamas.

Sometimes it seems as if all the developers, casino owners, and resort architects in the country have on their desk a copy of *Learning from Las Vegas*, Robert Venturi, Denise Scott Brown, and Steven Izenour's slim volume on architecture, urban planning, and the pleasures of decorated "sheds." Published in 1972, it may be the most influential book of the century on the subject—and probably the most misunderstood. Instead of becoming more receptive to the wisdom of "common" taste, resort builders saw in the critical essay permission to build immodest monuments of heroic proportions—the New York, New York casino being one of the latest over-the-top examples.

Today, the vernacular Vegas that inspired Venturi is being torn down, its hotels, motels, and wedding chapels replaced by multilevel retail, restaurant, and entertainment complexes folded into hotels and casinos. On the drawing boards are such projects as a Roman arena big



Brennan Beer Gorman's Fantasy Beach, in Hurghada, Egypt, features highly stylized, modern forms in a desert landscape.



The Dharmawangsa Hotel in Jakarta, Indonesia, designed by Sandy & Babcock International, comprises 280 time-share apartments, all of which were sold before the resort opened.

enough to stage chariot races; a replica of the Pantheon; Paris–Las Vegas, featuring the Eiffel Tower under a fake Parisian sky; an Egyptian desert marketplace; and the old city of Venice, complete with campanile, canals, gondolas, and palaces. "You *can* improve on the real thing," says Wolff, whose company is responsible for the Venetian project. "We know that people often prefer the experience of reality to reality itself."

Tom Russell, managing director of WATG's London office, notes that the controversy surrounding thematic architecture is nothing new. "The Houses of Parliament in Westminster was called a thematic 'abomination' by the architectural establishment of the time. So was the Natural History Museum in Kensington. Both are considered masterpieces today."

Entertainment. Edutainment. Ecotainment.

Theming, though, is really just another name for entertainment. And, says Hornberger, "Resorts are becoming more entertainment oriented, just as retail and restaurant developments have focused on entertainment." Today, edutainment—education made fun—is on everyone's mind. Disney spearheaded the trend in 1996 with the Disney Institute, the first resort that aimed to educate its guests. A small lakeside town with a Jeffersonian feel, the 457-room enclave was designed by architect Thomas Beeby of Hammond Beeby and Babka. Its facilities include 28 "program studios" where vacationers partake in such activities as animation, travel photography, topiary design, and rock climbing.

Walking the fine line between educating guests and patronizing them are "ecosensitive" resorts that deliver a variety of cultural and regional experiences. It can be as simple as a good concierge acting as a full-time curator, directing guests toward their next discovery—a mountain hike, a farmers' market, a religious festival, or a local spa. But it seems that any hotel incorporating indigenous crafts, customs, or cuisine can call itself ecologically (or at least politically) correct.

According to WATG's Russell, though, the eco trend only makes sense for resorts in remote locations: safari hotels promoting animal habitat conservancy, ecological resorts promoting energy conservation, historical resorts promoting regional culture and heritage. "Culture can also be an alibi," remarks BBG's Leroy. "For the first few days, guests visit remote temples or explore distant marketplaces. It's a way for them to deal with their guilt. It gives them permission to crash by the pool later."

Celebrity appeal

A subset of the edutainment trend are "designer destinations," small, cutting-edge, urban hotels where guests learn about good taste. At the Mondrian in Los Angeles, designed by Philippe Starck for celebrity hotelier Ian Schrager, a casting agent was brought in to hire the staff; there is a furniture price list in the bathrooms; and Raymond Chandler's *Farewell, My Lovely* replaces the hotel Bible. Other oh-so-tasteful boutique resorts are Starck's Morgans and Royalton, Christian Liaigre's Mercer, Bill Scofield's Soho Grand, and Pasanella + Klein Stolzman + Berg's Mansfield, just to mention some of New York's chicest pieds-à-terre.

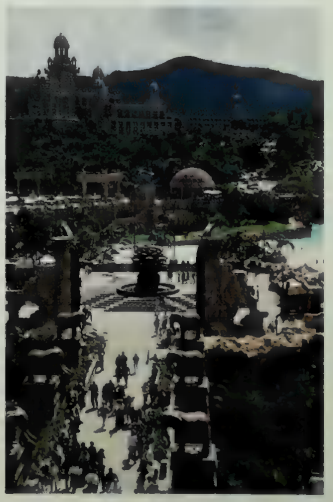
These urban getaways often attract wannabe celebrities—people who want the allure of privacy but hate to miss an opportunity to see their name in print. A much smaller number of designer destinations cater to the truly rich and famous. Architect Edward Tuttle, an American who lives in Paris, has single-handedly defined the genre by designing almost exclusively for Amanresorts. Breathtakingly beautiful, these hotels offer room and board from about $1,000 a day.

But even that is not the top of the scale. Heydar Ghiai & Sons, an architectural firm with offices in Switzerland, Costa Rica, and San Francisco, specializes in (real) imperial palaces and high-security resorts for "political figures, monarchs and their entourages, and people who do not want to be bothered." Yves Ghiai, who runs the San Francisco office, explains: "We design a series of pavilions on an old Persian architectural principle. We build layers of privacy into the access: arcades, foyers, antechambers. This is where the real intrigues and discussions take place."

All the comforts of home

"Living healthy" resorts, anchored around a spa, try to teach guests how to relax and enjoy the moment. With the realization that no hotel today could survive without boasting at least a health club, more and more luxury resorts are enlarging their exercise, fitness, and body-treatment facilities—to up to 30,000 square feet—and offering classes on wellness of mind and spirit. These hotels often add "& Spa" to their names, suggesting a world of sparkling indoor swimming pools, relaxing body wraps, glamorous guests, and delicious light cuisine. Witness the Ojai Valley Inn & Spa, the Givenchy Hotel & Spa, the Sonoma Mission Inn & Spa, the Green Valley Fitness Resort & Spa, and so on.

The peace of mind that spas offer (or at least promote) is the ultimate resort destination. If guests can access this serene place within themselves, they will always feel that they have arrived. What most travelers are searching for is a unique transformative experience.



WATG's South African resort, The Palace of the Lost City, is themed around a fictional "lost kingdom."

Not surprisingly, spas exploit the same devices other resorts use to capture the experience of respite—just more so. Hassle-free environments. Architecture that's part of the landscape. Meticulously detailed bathrooms. The sound of water. A seamless connection between indoors and outdoors. The ability to stroll from place to place. Offbeat objects. Technology that's available but not seen. Surfaces you can touch. Furniture for hedonists. A staff that always says "yes."

In resort architecture, it's not the journey that counts—scrap that cliché. What guests really want is to come home. ■

1 Hotel Explora in Atacama San Pedro, Chile

A RUGGED BUT LUXURIOUS HOTEL DESIGNED BY CHILEAN ARCHITECT GERMAN DEL SOL CAPTURES THE SPIRIT OF ITS DESERT SETTING.

by Clifford A. Pearson

Project: *Hotel Explora in Atacama, San Pedro de Atacama, Chile*
Architect: *Germán del Sol, Arquitecto—Germán del Sol, principal-in-charge; Horacio Schmidt, Nicole Labbe, architects; Patricio Parada, designer; Hernán Fierro, Carlos Venegas, graphic artists*
Engineers: *Fernando del Sol V. (structural); Renato Lorca (electrical)*
Consultants: *Pedro Ibañez SM and Germán del Sol (landscape architecture); Francisco Cervantes (sanitation and heating installation); BAPA (water treatment and sewage treatment); Consejo de los Pueblos Atacameños (cultural); Jorge Schmidt (mature tree transplantation)*
Building contractor: *Salfa S.A.*

Cost: *$18 million (Phase I)*

One of the driest places on earth, the Atacama Desert in northern Chile demands respect. Building there requires understanding the rules of the land and honing an acute sensitivity to place.

Like the Explora Hotel in Patagonia (RECORD, October 1996, page 108), the new one in San Pedro de Atacama is designed as a luxurious outpost in a rugged land, a comfortable haven from which visitors can explore a remote but beautiful place. Both hotels were designed by Germán del Sol, a Chilean architect based in Santiago, and offer guests a choice of daily guided tours into the wilderness.

In Patagonia, where winds regularly hit 70 miles per hour, del Sol designed the 30-room hotel as if it were a taut ship wrapped in laminated-pine clapboard. For the Atacama Desert, the architect took a different approach, creating a sprawling *estancion* enclosing large patios and terraces.

Phase I of the Explora in Atacama encompasses 82,000 square feet and accommodates 100 guests in 50 rooms. A second phase with 26,000 square feet and 50 more guest rooms is envisioned and will be built eventually.

Because the relative humidity in San Pedro is often as low as 2 percent and sometimes even approaches zero, the sky is remarkably clear and the sunlight very



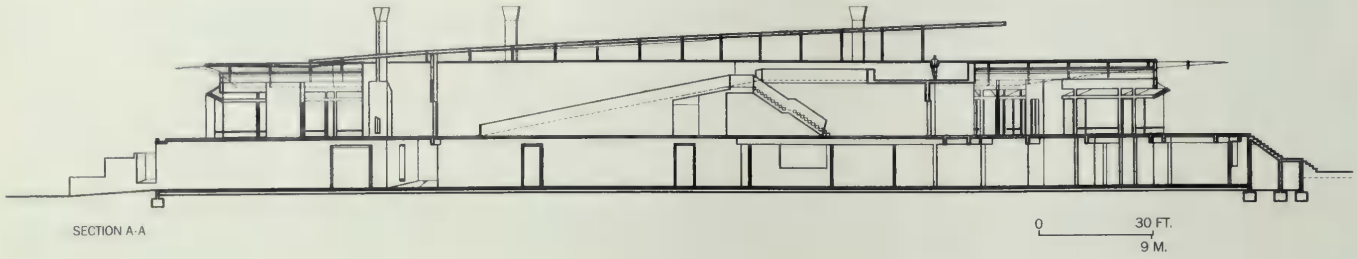


The hotel is "an invitation to guests to stop wandering and experience a unique place," says the architect. Overhanging roofs and landscaped patios (opposite and above) make for great places to relax. The low-slung buildings fit quietly into their setting (top).



SITE PLAN

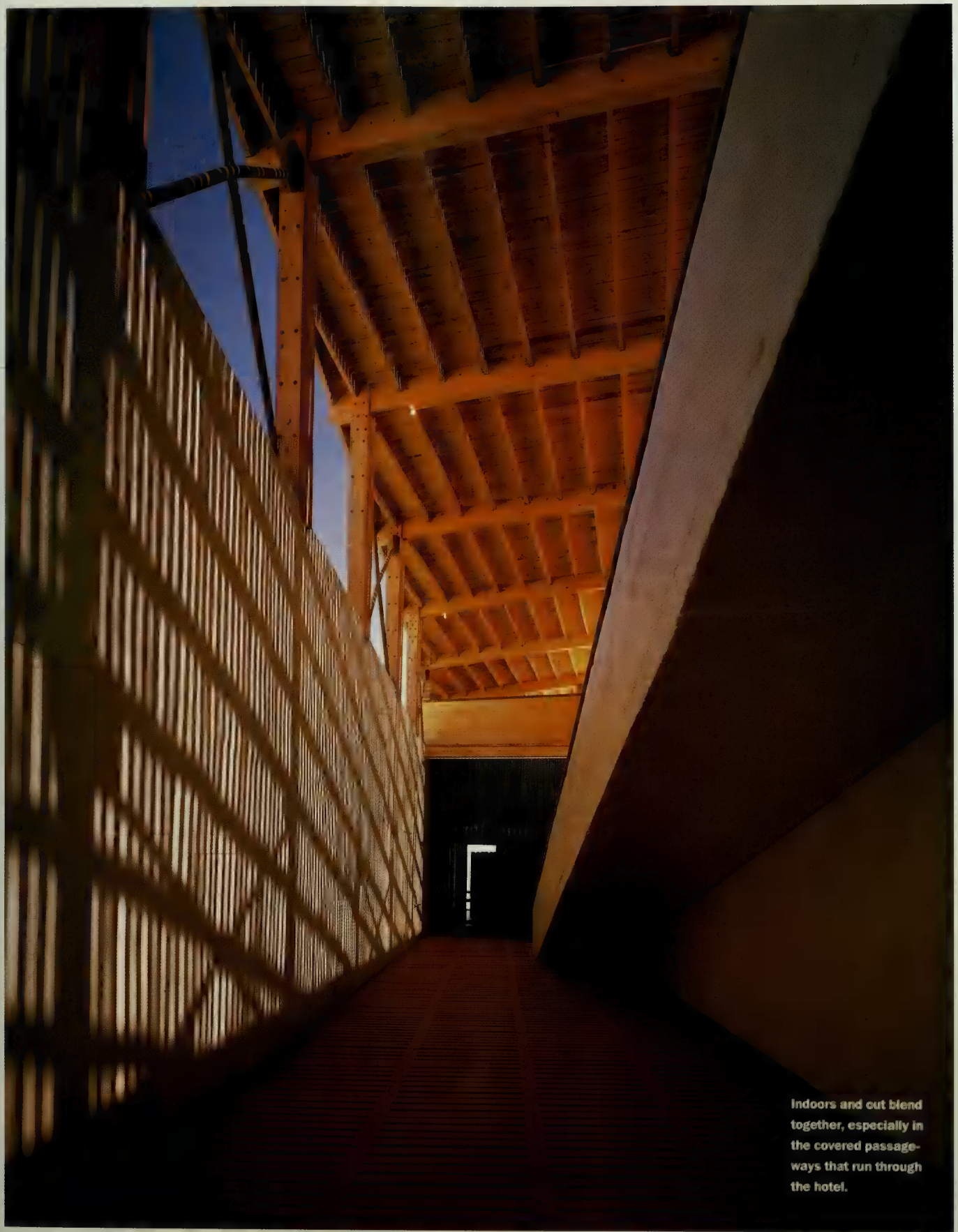
1. *Entry*
2. *Parking*
3. *Stables*
4. *Existing house*
5. *Hotel*
6. *Water-treatment plant*
7. *Sauna*
8. *Pool*



The main building (section above) is raised 14 feet above grade to give it views over the guest room wings (below). To minimize disruption in wildlife patterns, the hotel is surrounded by irrigated fields that are open to roaming packs of llamas and alpacas.



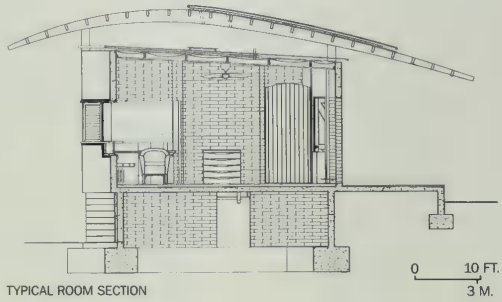




Indoors and out blend together, especially in the covered passageways that run through the hotel.



GROUND FLOOR



TYPICAL ROOM SECTION



Inside the hotel, the designers used color on elements that people touch, such as doors, window frames, and furnishings. Walls, on the other hand, were painted white or kept unfinished. Colors were inspired by those found in old Atacaman textiles.



strong. After spending time outdoors, guests usually find that their eyes need a rest.

Controlling the light was one of the main design challenges facing the architects. "We needed to soften the light," explains del Sol. To do this, he and his colleagues designed gently arching roofs that extend beyond the building envelope to protect sitting areas. The curving roofs actually sit above lower flat roofs, allowing light and air to circulate between the two layers and—by means of skylights—to the rooms below. In the public portions of the hotel, deep piers block much of the sunlight from coming directly inside. "You don't want the rooms to be dark, but you need to temper the sun," says del Sol.

Although it is a desert, the Atacama has plenty of water, thanks to runoff from the nearby Andes Mountains and underground aquifers. Natives of the area, descendants of the ancient Inca and Tiahuaniaco peoples, have built canals and aqueducts to irrigate their fields for thousands of years, and del Sol preserved those found on the site. He also restored existing adobe houses that are now used by local guides employed by the hotel and for functions such as barbeques and al fresco dining.

Unfettered by any allegiance to gridded geometry, the natives of the Atacama have traditionally sited



An important goal in designing the hotel's interiors was to capture views while also softening the strong sunlight. Among the strategies used were slatted wood trellises to shade outdoor rooms (opposite bottom), deep piers on bands of windows (left), and an angled transom beam that bounces sunlight inside (below). The overall effect is to wash interiors with daylight.

their buildings in response to the dictates of the land. Del Sol did the same in laying out the Explora Hotel in San Pedro, allowing the wings of guest rooms to snake around two stone-paved patios. Trees such as carob, oak, and pepper provide shade in the outdoor spaces.

Although the hotel's architecture makes no direct attempt to recall the local vernacular, the architects did evoke the raised irrigation fields found in the region by setting the hotel on a platform reached by a series of steps and ramps. They also clustered the buildings around outdoor spaces to recall the small towns that pop up in the desert wherever there is water, explains del Sol. Like traditional Atacaman structures, the indoor spaces in the hotel are much smaller than the outdoor ones and there is a purposeful blurring between the two. Indeed, two long "alleys" run through the main building, serving as outdoor corridors that seem almost enclosed.

The buildings have poured-concrete foundations and walls with laminated-wood beams supporting copper-clad wood roofs. Due to the very dry climate, the contractor had to water the concrete more frequently during setting and all wood pieces had to be specially dried so they wouldn't crack.

Although standardized sizes of laminated-wood beam (mostly 26 and 80 feet long) were used to simplify construction, the architects wanted the hotel to have a sense of irregularity. "In Atacama nothing is precise or regular," says del Sol. "We wanted to capture a feeling of imperfection." As a result, the plaster finish of the walls was kept rough, and natural materials like wood and stone were used so the hotel would age well. "The walls actually look better when they're covered with sand," notes del Sol.



The outlying buildings on the site include a simple concrete stable near the entry and a series of slate-lined pools and small saunas. Water from the pools flows into irrigation canals that slice through the property.

The most important aspect of the entire project, says del Sol, was making all of the buildings feel as if they are integral parts of the landscape. "When you're here at the hotel, you really feel that you're in the middle of the setting, that you're part of the Atacama." ■

Sources

Copper roofing: *Salfa S.A.*
Slate floors: *Pizarras Ibericas S.A.*
Bathroom fixtures: *American Standard*
Sisal rugs: *Silacor Larrain*
Sofas: *Designed by the architect and made by J. Fuentes y Cia*
Stained native wood furniture: *Designed by the architect and made by David Barrios*
Light fixtures and painted steelwork: *Designed by the architect and made by Jorge Richter*

2 Las Ventanas al Paraiso Cabo San Lucas, Mexico

CAREFUL ATTENTION TO INDIGENOUS MATERIALS, CRAFT, AND VEGETATION DEFINES THIS BAJA RESORT.

by Kira L. Gould

Project: *Las Ventanas al Paraiso, Cabo San Lucas, Mexico*
Owner: *Fraccionadora Cabo Real*
Architect: *HKS Architects—Nunzio DeSantis, AIA, partner-in-charge; Jeff Jensen, senior designer; Richard Johnston, project architect*
Engineers: *W. L. Thompson Consulting Engineers (civil); Geox (geotechnical); Brockette Davis Drake Inc. (structural)*
Consultants: *SWA Group (landscape); Craig Roberts Associates (lighting)*
Contractor: *Urbec Lellis-Don*

Cost: *$24 million*

It used to be that a resort getaway had to be lush, green, and tropical—no matter where it was located. But as vacation spots around the world began to look alike, indigenous character became increasingly appealing to some travelers—a fact that developers have not failed to notice. As a result, new vacation destinations are more diverse, incorporating regional materials, styles, craft, and landscaping.

The owner of 18 acres of beachfront near Cabo San Lucas, Mexico, understood the lure of the local when he asked a multidisciplinary design team to create a resort that would be more Baja desert than Maui, the Hawaiian destination many neighboring getaways seem modeled after. The team responded with Las Ventanas al Paraiso, a 61-suite resort that reflects its desert location and Mexican heritage.

The resort's name means "windows to paradise," and here it hardly seems an overstatement. The landscape and landscaping are dramatic and colorful, from the golden cragginess of the Baja coast to the deep blue of the Sea of Cortez to the bright desert wildflowers that are visible at every turn.

While the designers and the owner were seeking something fresh and comfortable, "we were determined to avoid creating an artificially tropical place," says Nunzio DeSantis, AIA, managing principal with HKS Architects. "A desert environment can be just as beautiful [as the tropics] if you know what you are doing. Las Ventanas is among the very few places that are proving that resorts should be responsive to their environments."

Kira L. Gould is a freelance writer living in New York City.

A sense of place

Las Ventanas's success comes in part from the fact that tourists' expectations have changed. "The experienced world traveler knows now to go somewhere where he can find true sense of place," explains Chuck McDaniel, design principal with the SWA Group, which was responsible for the landscape architecture. "The fact that Las Ventanas is more reflective of its environment reverberates with people, whether they fully realize the appropriateness or not."

Nature had done a lot of the landscape work already. A riot of blues—sky, sea, and a three-level pool—provide a bracing counterpoint to the beiges and browns of rock, bleached pebbles, plaster, and sand. And this desert does bloom. "We knew that with just a little water, some indigenous plantings would flower and grow in ways usually reserved for the moments after a rainstorm," says McDaniel, who grew up in arid West Texas.

Still, it's not all desert. Rectangles of grass framing the swimming pool introduce some coolness at ground level. "Large decks would have been very hot no matter what they were made of," McDaniel continues. "And this patch of verdant lawn at the edge of a sandy desert makes for an interesting visual contradiction."

And a sense of personal scale

DeSantis explains that it was important that the designers reduce the scale to a personal level. "We didn't want to create a monster project. We broke down each public area into its own jewel box of design. The guest can become very involved with each space."

The architecture manages to avoid Baja's pseudo-Mayan and Spanish Colonial clichés. According to William Calloway, president of SWA, "The team decided early on not to import building materials or workers from the United States or mainland Mexico, opting instead for local materials, plants, colors, and craftsmen." Contemporary Mexican architects such as Ricardo Legorreta also influenced the clean lines of the buildings here, DeSantis says.

The result seems like a small, pristine Mexican village. Low-rise buildings, connected by stairs, bridges, and curving paths, radiate

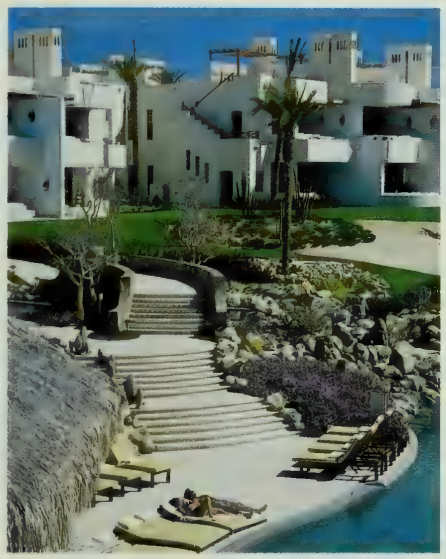


from the main lobby. According to DeSantis, "the guest's first taste is a powerful one. From the lobby there is a spectacular view of the ocean, framed by architectural clusters and a desert landscape."

The site slopes down toward the Sea of Cortez, to an escarpment above the beach, on which the hotel buildings seem to be hung. Every room has its own panoramic ocean view and welcomes the outdoors, though the rooms also feel private. The suites have patios or terraces, marble showers, traditional Concheula limestone floors with inlaid pebble work, fireplaces, and telescopes for whale-watching.

The focus on local materials and craft has resulted in an extraordinarily hand-molded feel. "Nothing is smooth and perfect—everything has an original touch to it," McDaniel says. "There's a culture of low technology in the area that forces the builders to touch everything." That tooled feeling, DeSantis adds, is what makes Las Ventanas so sensory. "Every surface, every stone, looks as if it were created by hand and placed by hand. And they were." ■

Sources
Wood windows and doors: *Custom*
Wood sliding doors: *Häfele*
Lighting: *Lutron*
Hardware: *Jado*





The SWA Group, the resort's landscape architect, incorporated wildflowers and other vegetation indigenous to the Baja Peninsula.

The architecture, too, was inspired by local traditions, such as the *latilla* and *vega* roofs that cover the resort's open walkways.



3 Pousada de Santa Maria do Bouro Braga, Portugal

WITH RESTORED AND NEW MASONRY, A SUBTLE ADDITION, AND PRECISELY DESIGNED DETAILS, A RUINED MONASTERY BECOMES A SPARE RESORT.

by David Cohn

Project: *Pousada de Santa Maria do Bouro, Braga, Portugal*
Owner: *ENATUR (Portuguese National Tourism Corporation)*
Architect: *Souto Moura Arquitectos—Eduardo Souto de Moura, architect; Marie Clement, Ana Fortuna, Manuela Lara, Pedro Valente, design team*
Engineers: *G.O.P. (structural, electrical); Gestão Engergia Térmica (thermal energy management)*
Contractor: *Soares da Costa*

Cost: *$8.5 million*

The Pousadas of Portugal, a chain of state-owned luxury hotels, are one country's answer to an enviable but difficult problem: what to do with a surplus of obsolete medieval castles, Renaissance palaces, Baroque monasteries, and disused convents. Since 1942, 22 such historic properties have been transformed into small, full-service hotels. (There are another 21 pousadas in modern structures.) Small, usually with fewer than 30 rooms, they are scattered across the country, often in remote rural settings and national parks. The pousadas also host weddings, banquets, business retreats, and other events. While not highly profitable in themselves, they form a prestigious support network for culturally based tourism, and help maintain a priceless architectural patrimony.

The Pousada de Santa Maria do Bouro, the latest addition to the chain, occupies an imposing Cistercian monastery in the tiny village of Bouro—a handful of houses above the lush banks of the Cavado River. Originally founded in 1162, the monastery has been rebuilt several times; the present structure dates to the 18th century and is attached to a church that is still in use. Today, the Pousada de Santa Maria serves visitors to the ancient northern city of Braga, 10 miles to the west, a religious center famed for its historic churches and its Easter Week processions.

David Cohn is an international correspondent for ARCHITECTURAL RECORD and lives in Madrid, Spain.

Monks' cells as guest rooms

The pousada's 33 rooms are arranged around two open spaces: a U-shaped court planted with orange trees, and a cloister one level above that has been restored as a freestanding circuit of arcaded walls. Guest rooms are austere modern equivalents of monks' cells. The former kitchen has become a dining hall, its massive, pyramidal brick chimney transformed into a



1. *Hotel*
2. *Church*
3. *Swimming pool*

Before the restoration, the monastery was a roofless ruin.





One of the pousada's main public spaces is this courtyard (left), which is planted with orange trees. The church, still in use, peeks over the former monastery's walls. The monastery's kitchen became a dining room, and its massive, pyramidal chimney turned into a skylight (below).

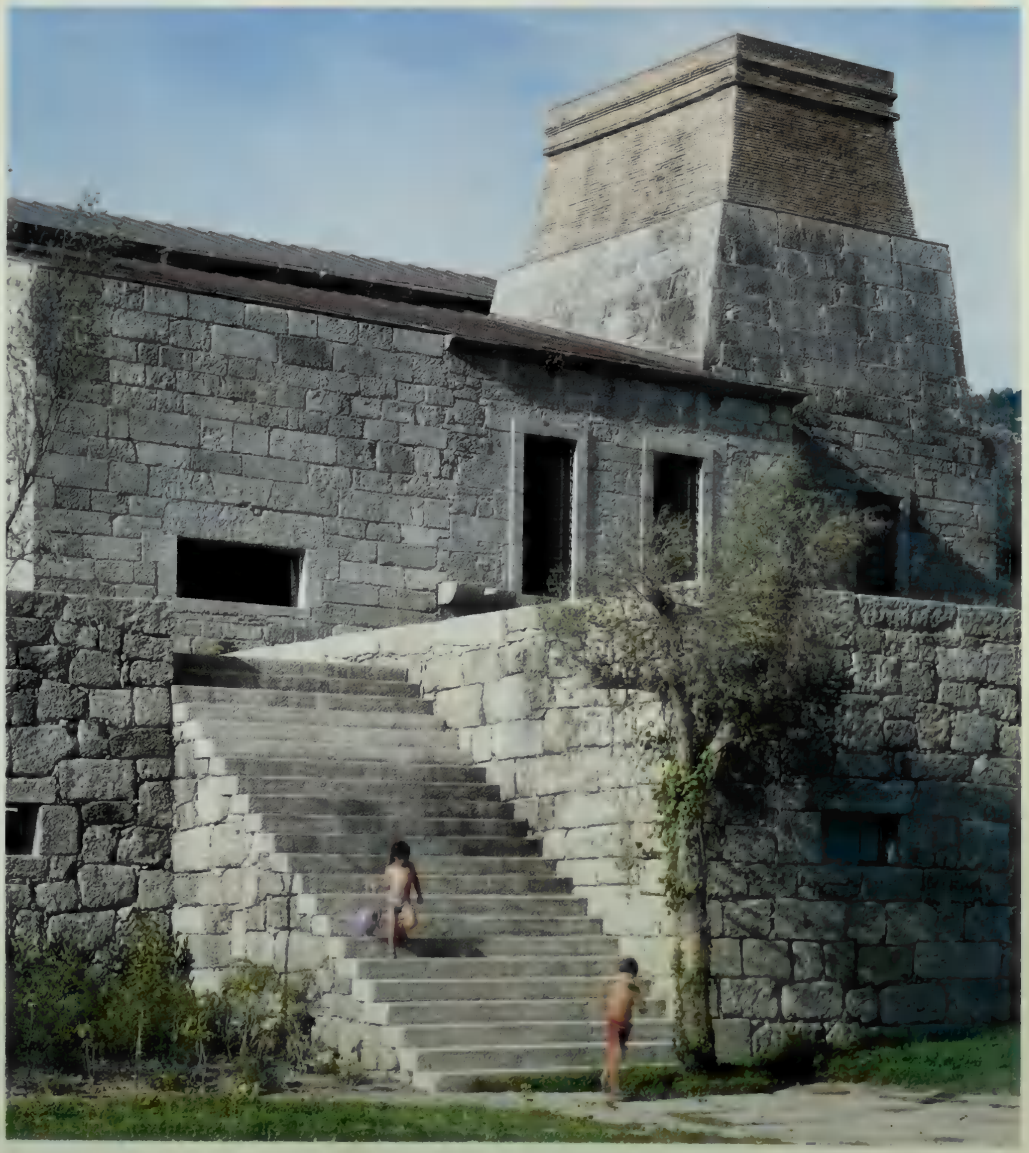
monumental skylight. A new service wing containing a laundry, kitchen, and mechanical plant was built against the lower flanks of the southern facade, its roof acting as a terrace to the public rooms off the cloister. A tennis court and small oval swimming pool are nestled into the semi-wild grounds, which retain their ancient paths and stone walls.

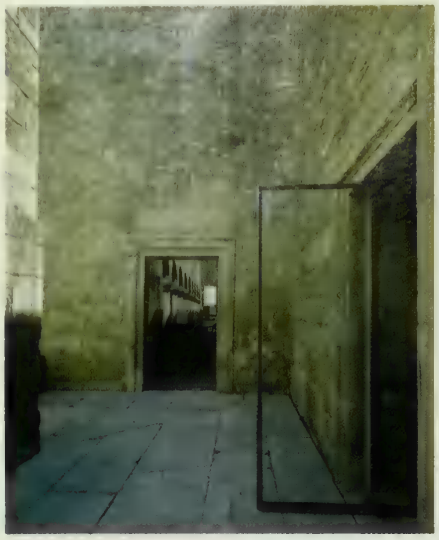
Beginning with ruins

When Portuguese architect Eduardo Souto de Moura began work on the monastery in 1989, the building was an overgrown ruin; it had been in decline since 1834, when the state seized and auctioned off church properties. By the end of the 20th century, little remained but its crumbling walls; there were no roofs or floors.

Souto won the commission largely because of his experience with traditional stonework. A student and frequent collaborator of architect Alvaro Siza, he has designed several private houses incorporating new and rehabilitated stone walls. Souto and a team of skilled masons labored for three years on the ruin, consolidating the walls and rebuilding large parts of the upper floor, the cloister, and the kitchen-turned-dining hall.

Souto did not attempt a literal restoration of the monastery to its 18th-century state. Rather, he decided to simply make the ruin

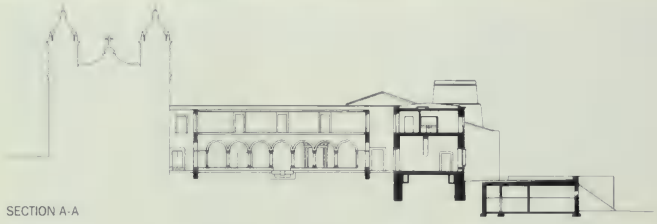






Throughout, old meets new in subtle but surprising ways; here, a metal door frame is set into the 18th-century stone wall (far left).

One level above the open courtyard is the arcade (left), which was left as a free-standing ruin, cleaned up but not restored.





1. *Entry*
2. *Administration*
3. *Cloister*
4. *Bar*
5. *Restaurant*
6. *Guest rooms*

habitable, using modern means but with great respect for the remains. To Souto, this approach is consistent with the monastery's history over the last eight centuries. "Historic buildings have always evolved to serve new functions, to be manipulated and transformed, without any moral implications," he maintains. "What charms us about the historic city is this layering of different voices."

Souto introduced a series of minimal, carefully detailed elements into the reconstructed monastery. To stabilize the walls laterally, lost wood beams and joists were replaced by an exposed Cor-ten steel deck of the architect's design. A frame of horizontally laid I-beams was anchored to the walls and topped with steel plate, concrete, and wide-plank wood flooring. The building's missing pitched roofs were replaced with green roofs—flat decks covered with soil and planted with ground cover. Souto also designed custom hardware for the pousada, including the brass window frames, which are virtually invisible from the exterior. They drain via an internal channel and an exterior weep, and are set on the inside of window openings without sills, so as not to interrupt the thick stone walls.

Blurring new and old masonry

Souto initially planned to distinguish new masonry from old, but he abandoned what he calls "this Manichean idea" during construction. He used blocks of stone recovered from the site and traditional sand-and-lime mortar in order to match the color and texture of existing walls; the main floor boasts well-trimmed blocks and Baroque window openings, while the upper floor has more irregular stone, with corners and windows neatly framed. The new service wing is dressed in a rustic grain of large, irregular blocks with more open joints, closer to the rough stonework of retaining walls and rural stone fences than to the fine masonry of the monastery.

Inside, the lack of existing floors made the introduction of elevators, pipes, and other services relatively easy. Souto had more problems with the air conditioning, which he explains is "obligatory for a five-star hotel but against the nature of a centuries-old building." Large ducts under the main floor deliver air via discreet perimeter grilles. In the guest rooms, air-conditioning units supplied with chilled or hot water from the roof are hidden above the bathrooms. Minibars, a difficult requirement for the small guest rooms, are recessed in the walls.

Souto's intention with these details was to make the resolution of the design problems of fitting





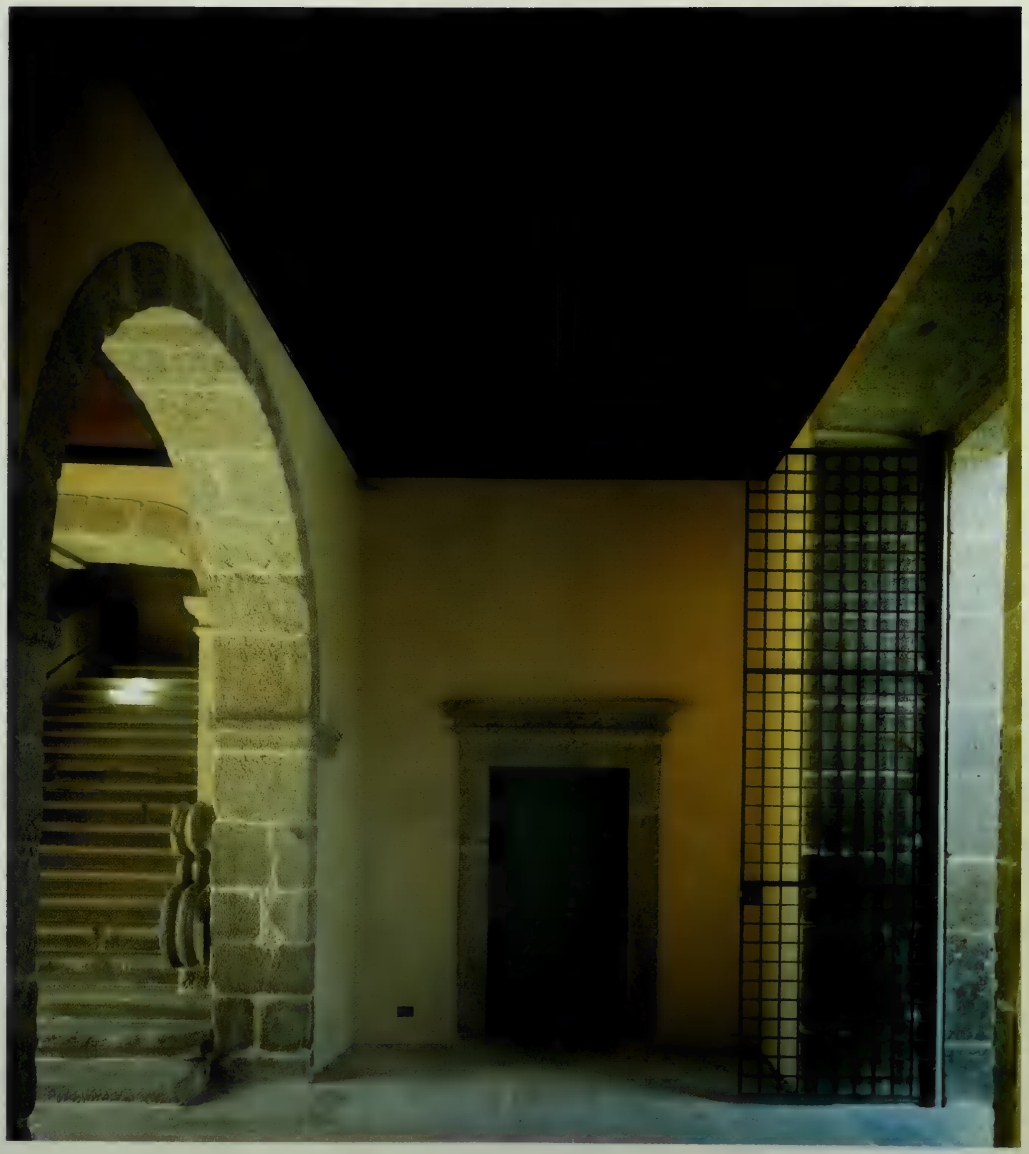
The pousada's interiors reflect the building's monastic history; guest rooms are light and minimally furnished, and the public spaces are ascetic but welcoming.

modern lodgings into an older, spartan structure seem natural and effortless. Low labor costs and surviving regional craft traditions permitted a quality of work that would be difficult to match in the United States, although Souto attributes this difference to questions of "tradition and culture" more than expense.

This monastic retreat seems to rise from its site like a prehistoric monument, a man-made artifact that was once almost lost to nature. Souto's reconstruction is full of echoes of its former abandon: the flat roofs overhung with bits of vegetation, the roofless cloister, the window openings, some with their sky-blue curtains drawn as if bits of sky could still be seen through the structure. It comes as something of a shock to find a brightly colored beach towel hung out to dry in one of the windows, or to watch a pair of children scampering down a cold stone staircase to the pool—signs of a magnificent ruin come to life. ■

Sources

Steel doors and windows: *Cor-ten*
Elevators: *Grupmor*
Bathroom fixtures: *Designed by Souto de Moura and Humberto Viera*
Chairs: *Size Veira, Thonet, Jacobsen*
Tables: *Designed by Souto de Moura and Alvaro Siza*
Wall coverings: *Naturally pigmented plaster*



4 Four Seasons Resort at Sayan Bali, Indonesia

IN A LUSH VALLEY, A FULL-SERVICE RESORT STEPS DOWN THE TERRACED SLOPES, ITS GUESTS SETTLING AT A POOL AT RIVER'S EDGE.

by Tony Stanton

Project: *Four Seasons Resort at Sayan, Bali, Indonesia*
Owner: *Hotel Properties Limited*
Architects: *Heah & Company—John Heah, principal; Ben Smart, architect-in-charge; Tom Cary, Gary Fell, Stefan Kueppers, James McCosh, Victoria Pike, design team; Jamie Macpherson, interior designer-in-charge; Louise Brooker, John Heah, Steven Maxwell, Victoria Pike, Ben Smart, Allison Thomas, interior design team*
Associate Architect: *HST Architects*
Engineers: *Trigram (structural); Harris & Sutherland (civil/structural); Beca Carter Hollings & Ferner (mechanical/electrical)*
Consultants: *Design Flow Solutions (environmental design); SCI (landscape); STO Design Group (hydraulics)*
Contractors: *Tunas-Jaya Sanur; Multiplex*

Cost: *$30 million*

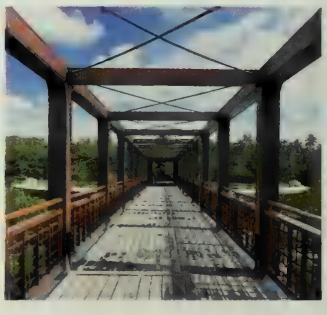
Tony Stanton is a writer based in Bali and Singapore.

Given a dramatic site above the curving Ayung River in central Bali, architect John Heah could have played it safe and modeled his new Four Seasons resort on the upscale, neo-vernacular hotels that have proven so successful in other parts of the Indonesian island. But instead of designing wood-framed structures reminiscent of traditional Balinese pavilions and private enclaves with head-high walls that echo those of local family compounds, the Malaysian-born, London-based architect created a decidedly modern hotel, where local materials and craft are combined with inventive design, geometric forms, and lots of concrete.

The resort's size and nontraditional design, as well as the amount of concrete in its foundations and walls, made this a controversial project. Located just 10 minutes from Ubud, the island's artistic hub, the hotel drew the attention of many Balinese and expatriates concerned about unsympathetic development in the area. Letters of protest to the *Jakarta Post* and invective from nearby property owners greeted the project when it began in the mid-1990s. Its elliptical central building (topped with a silvery lotus pond) prompted inevitable comparisons to a spaceship landing in the pristine valley.

While the architect set out to design a contemporary resort, he thought of it as one that complemented, not injured, the landscape. "When I saw the site, I decided to nestle the hotel along the side of the ridge, rather than build on top of it," explains Heah. "I wanted it to melt into the landscape."





Now that it's completed, the Four Seasons Resort at Sayan has won over many of its critics and shown itself to be more sensitive to its site than people first imagined.

Circulation from above

Building on the slopes of a ravine leading down to the river, Heah realized there was an opportunity to enter the hotel from the top. The result is a dramatic experience for hotel guests, who arrive by car at a small reception area, then walk 180 feet across a steel-and-teak bridge suspended 65 feet above the ravine. On the other side is a

Arriving guests enter by crossing a 180-foot-long bridge (above). The resort fits into the slope of a ravine leading down to a river (left).



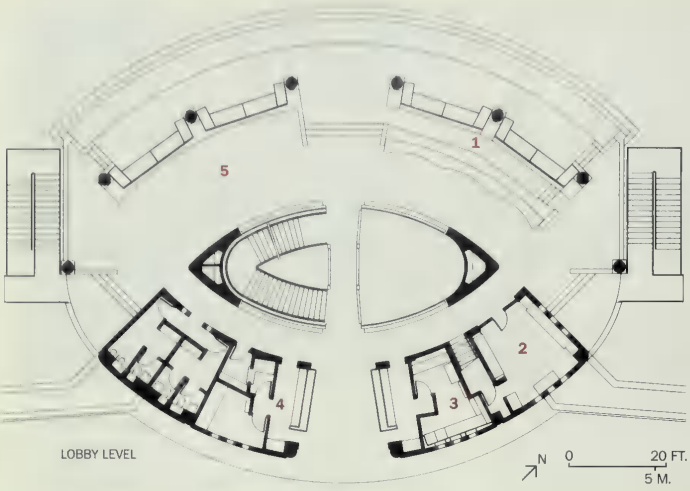
SITE PLAN

1. *Generator building*
2. *Entry courtyard*
3. *Main building*
4. *Villa*
5. *Swimming pool*

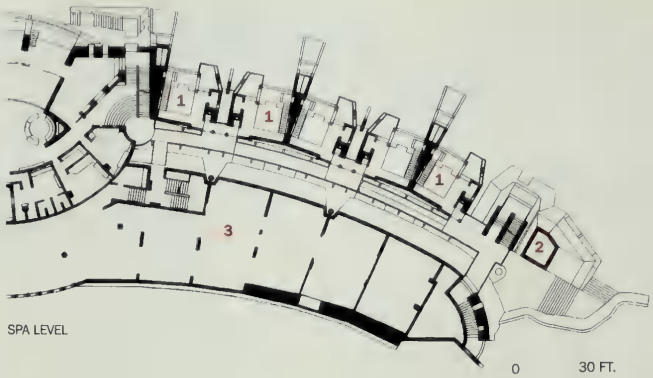


Each villa has its own plunge pool. The riverside terraced pool (above) serves the entire resort. The main building's facilities include a restaurant, bar, and gym (below).





1. *Bar*
2. *Shop*
3. *Concierge*
4. *Front desk*
5. *Seating*



1. *Duplex suite*
2. *Conference*
3. *Mechanical*





The entry bridge hangs 65 feet in the air (top). Massive concrete walls overhung with plants help create textured passageways (bottom).

modest pavilion at the edge of a large elliptical lotus pond that seems to hover above the surrounding terraced rice fields. A flight of stairs under the pavilion's thatched roof takes guests down to the lobby level, where a curving terrace lounge offers panoramic views of the valley. Down another level is the restaurant and below that, the spa.

Two curving wings with nine guest rooms each flank the pavilion. Thirteen of the rooms are duplexes, with living rooms, dining rooms, kitchenettes, and terraces on both levels. Above them are five large single-level suites. Outdoor walkways and bridges provide access to the suites from behind, allowing all of the rooms to have views of the river valley and rice paddies.

The most luxurious accommodations are the 28 villas carved into the hillside and virtually hidden by jungle. From the main building the only signs of them are small pyramidal roofs that shelter open sitting decks and stairs. Like the main building, the villas are entered from above. Each has its own patio, plunge pool, and private gardens. As with many parts of the resort, the villas do an excellent job of bringing the outside in. "We tried to infuse the interior with the exterior with no real physical barrier," says Heah.

Privacy, protection, water

Throughout the project, Heah used level changes and the sloping site to create a sense of privacy and of procession. Whether walking from one of the terrace suites to the restaurant or from the main building to the pool at the river's edge, guests find themselves winding around and down the site, discovering new things at each turn.

Water too runs through the property, cascading down moss-covered walls, into offering bowls, and finally, one assumes, into the river: an architectural evocation of *subak*, Bali's traditional irrigation cooperatives, which manage the water that runs through the island's terraced rice paddies.

"The building is contemporary in thinking," says Heah, "but we always felt that it embodies the essence of the land and cultural influences.... It is a conscious effort to develop a contemporary response to the spiritual and cultural influences of the Ubud area."

The smallest property in the Four Seasons chain, the resort also represents a change in approach from the company's first property at Jimbaran, in the southern part of Bali. "The Four Seasons at Jimbaran was a big success, but we wanted to give guests a diversity of

As the resort follows the ravine's contours (below), it mimics the forms of nearby rice paddies. The top level of the main building (bottom) includes a bar and lounge that commands a panoramic view of the river valley.











Individual villas are often visible only because of their pyramidal thatched roofs (above). Much of the furniture was designed by the architect (left).

experiences in Bali," explains Christopher Norton, general manager of the two Four Seasons hotels on the island. "We didn't want to just replicate the Jimbaran hotel."

Although modern in design, the resort was built using a combination of modern and traditional technologies. To ensure a watertight structure and reduce the thickness of walls, the contractor used high-quality concrete, which was mixed on-site. But because of the site's difficult slope, the contractor minimized the use of heavy (and expensive) equipment and relied more on inexpensive hand labor.

Heah also took full advantage of Bali's famed artisans, employing skilled woodworkers to carve decorative panels, carpenters to make 21-foot-tall wood doors for the villas, and metalsmiths to fabricate flashing and metal details. Heah designed much of the furniture in the hotel; like the buildings, it was informed by traditional forms, and some of it was made on the island.

At times, there were up to 2,500 people working on the resort. "Wives and daughters did the finishing work," Heah recalls, "while sons and fathers did the main structures and carpentry." As is common in much of Asia, most of the workers lived on site. Amid the chaos of construction the architect was impressed by the quality of work from the Balinese laborers. "The local workers weren't accustomed to such high-quality concrete. But they were willing to learn and ended up doing a great job," says Heah.

Hotel guests also seem to appreciate the craftsmanship. Lyn Middlehurst, editor and publisher of the *Gallivanter's Guide*, a travel newsletter, gave it the highest rating of all the new resorts in Bali. ■

Sources
Hardware: *D-line, Hafele*
Bathroom fixtures: *Kohler, Toto*
Electrical dimmers: *Lutron*
Textiles: *Mirah Burman*

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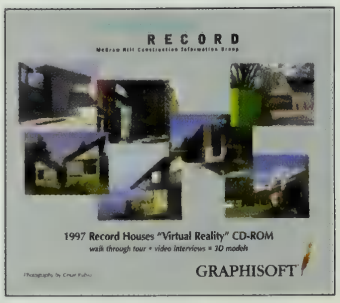
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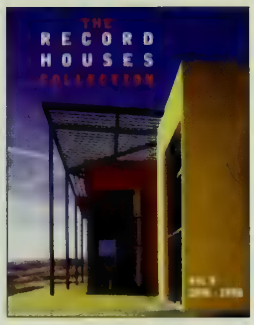
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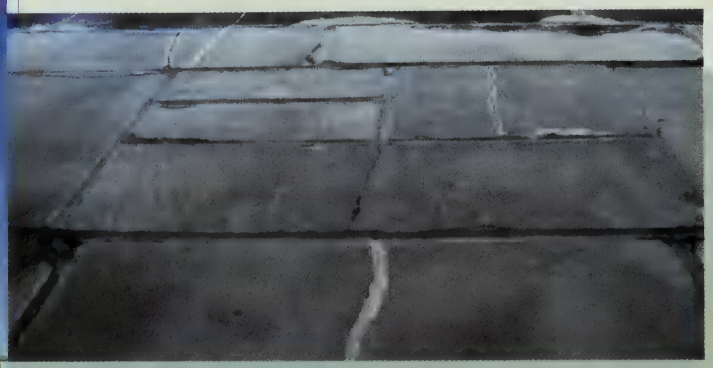
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CIRCLE 56 ON INQUIRY CARD

Restoring a Nebraska Landmark

CREATING A DATABASE THAT MAPS OUT EACH STONE ON THE FACADE MAKES IT POSSIBLE TO CHART AND DIAGNOSE FLAWS IN THE CAPITOL BUILDING.





by Stephen J. Kelley, AIA, and Dan Worth, AIA

The Nebraska State Capitol rises 400 feet above the mostly low buildings of Lincoln and the surrounding agricultural fields. Lee Lawrie's statue *The Sower* balances atop its dome, reminding viewers that this is a state founded on farming, a place where the land is often more important than the buildings on it. An exception to this is the capitol itself, a significant example of American art, landscape design, and civic architecture.

The Nebraska capitol is the result of a national design competition in 1920 that attracted some of the nation's best architectural firms. Each of the entrants remained loyal to the neoclassical traditions of the Beaux-Arts, submitting designs that were de rigueur for state capitols in those days. The exception was Bertram Grosvenor Goodhue. This vigorous New York designer, who was never formally trained as an architect, came up with a building that set an example for civic structures throughout the nation; it's a distinctly American building from a period when styles were almost always adapted from European examples.

Goodhue's plan achieved great beauty without resorting to all the traditional elements of Classical design that characterized most state capitols. The archetypal gold dome is still there, but it's perched on brilliant blue tile necking at the top of the high-rise office tower. The tower is an example of another evolving American form: the skyscraper. According to historic documents, it symbolizes the hopes and aspirations of the state, while the two-story base, which also stretches 400 feet, but on a horizontal plane, signifies the broad expanse of the Nebraska plains.

Stephen J. Kelley, AIA, is an engineer and a senior consultant in the Chicago office of Wiss, Janney, Elstner Associates. He specializes in the investigation and restoration of historic buildings. Dan Worth, AIA, is the managing principal of the Lincoln office of Bahr Vermeer & Haecker. He specializes in historic preservation.

Goodhue was among the first to incorporate an iconographic program into a capitol, using indigenous elements as architectural and decorative ornamentation. There are buffalo, pioneer, and corn motifs, as well as Native American references, all of which were sculpted after the stone blocks were in place, the sculptors working from scaffolding.

The building was the third capitol erected on the site; the first two structures were poorly built and had to be demolished. It was thus an essential part of the program that this rendition be built to last. To that end, Goodhue specified what he perceived to be the best construction materials available and was fastidious in how they were assembled. The stone coursing is different on all four sides of the tower, a detail that made construction more difficult and provided almost no aesthetic or structural improvement. The real impact was philosophical; Goodhue wanted a building that would endure.

But even before the new capitol was completed, in 1932, eight years after Goodhue's death, a light web of cracks became apparent on the tower facade. As early as 1929, an Omaha architect reported, "Cracks in

Continuing Education *Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 192 and follow the instructions.*

Learning Objectives *After reading this article, you should be able to:*

1. *Identify the significance of this building in American civic architecture.*
2. *Describe the flaws found in the exterior facade of the capitol.*
3. *Explain what caused the problems with the exterior facade.*
4. *Describe how the site survey and condition report were collected.*
5. *Explain how computer technology was used to document and design the work on the capitol.*





THE CAPITOL'S 437-FOOT TOWER RISES
high above the low surrounding buildings and flat prairie of Lincoln. The two-story base echoes and symbolizes the landscape.

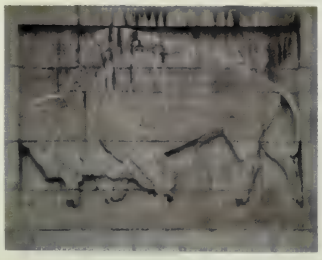
the capitol are due to weather and no defects in construction will be found." This was the first of many reports of the cracking, spalling, delamination, efflorescence, stone displacement, cracked mortar, and algae growth that were to become common on the exterior walls, though the seriousness of the distress was discounted at the time.

The committee looked to WJE because of its building diagnostics and laboratory capabilities, as well as its experience in restoring early skyscrapers; the firm's recent projects included the Woolworth Building in New York City and the Tribune and Reliance Buildings in Chicago. That expertise would help diagnose the problems with the capitol.

SKYSCRAPERS WERE A RECENT INNOVATION IN THE 1920S AND THE DESIGN AND ENGINEERING BEHIND THEM WAS SOMETIMES DICEY.

Photographic records indicate that the first remedial intervention took place in the decade following World War II, though specifics of the treatment remain sketchy. The capitol was repaired again in the 1960s when, among other things, organic growth was removed from the facade by pressurized water spray. In 1973, a major facade campaign included sandblasting, tuckpointing, and sealing cracks with epoxy. Each restoration attempt addressed the effects rather than the causes of the stone distress.

Despite these repairs, the cracks continued to form—often right alongside the places where epoxy repairs had been made. Finally, in the summer of 1995, the Capitol Environs Committee, set up by the state of Nebraska to take care of the capitol, hired Bahr Vermeer & Haecker Architects (BVH) of Lincoln, together with Wiss, Janney, Elstner Associates (WJE) of Chicago, as consultants for the Nebraska State Capitol Masonry Restoration Project. Their goal was to preserve the building's original fabric wherever possible; it had been designated a National Historic Landmark [illegible] nt hiring an architect with preservation expe[illegible] construction practices and materials. [illegible]itol allowed the firm to offer prompt service. The [illegible]sed with BVH's grasp of computer technology. One [illegible]s of visiting the firm's offices in 1995 "and not seeing a sing[illegible] With its technological expertise, BVH was able to create a [illegible] map flaws on the building's exterior. Such a database could guide [illegible]orationists in the repair process.



This buffalo is one of many iconographic elements on the building.

Building pathology

The team's first step was to conduct a site survey and prepare a condition report for the building. Like physicians, project directors Steve Kelley for WJE and Dan Worth for BVH, as well as other members of the team, became well acquainted with the patient, analyzed all the symptoms, and developed a diagnosis before embarking on restorative treatments.

The analysis of the exterior facade began with a review of the Capitol Collections archive, which contains about 200,000 papers related to the building, including correspondence, specifications, product samples, photographs, and, most important, 3,000 drawings, which range from Goodhue's original and priceless ink-on-linen working drawings to detailed shop drawings. The latter, which include numbered references to every stone on the building, became the basis of the inspection work and were used to prepare survey sheets on which WJE's field personnel took notes and recorded the various types of stone distress.

The capitol sits on a series of poured-concrete pilings, which rest sturdily on bedrock 30 feet below grade. Large reinforced-concrete grade beams, poured between these pilings, provide continuous support for the perimeter quadrangular masonry bearing wall. The tower is similarly supported on bedrock by a system of reinforced-concrete caissons on which the structural steel frame bears the tower. Settlement, therefore, was not a source of building distress.

WJE next conducted a site survey to generate a condition report. This would do the following: document, in written and graphic form, the condition of the various components of the building envelope; prioritize the restoration work required; develop construction cost estimates; and provide information to create a computerized database that would record distress on the facade.

Perched on rolling scaffolding and using binoculars, workers spent the fall of 1995 investigating the base portion of the building. The



THE STONE IS SPALLED AT SOME JOINTS
where ties bind the expanding masonry to the shrinking steel frame (above). Test panels were cleaned using nondestructive methods (right).

exterior surface of the tower was inspected from a swing-stage that was suspended from the 14th-floor observation deck. The dome and drum above the deck were examined by engineers who rappelled like mountaineers from lines attached to *The Sower.* Inspection openings, carefully conducted to cause a minimum of disruption to the building, uncovered hidden conditions. Building samples, including stone, brick, mortar, concrete, and sealant, were carefully removed and taken to the WJE laboratory for petrographic and chemical examination.

What went wrong?

Skyscrapers were a recent innovation in the 1920s and the design and engineering behind them was sometimes dicey. Goodhue conferred with H. G. Balcom, later the engineer for the Empire State Building, though he used an in-house engineer to do the work. Balcom and Goodhue both realized that the interplay between the envelope and frame of the tower and, to a lesser extent, the base could be, as Balcom said, "problematic," but they never realized how extensive the problems would be.

The Nebraska State Capitol is clad in buff-colored Indiana limestone—the same used on the Chrysler and Empire State Buildings—the stone par excellence for building construction at that time and still popular today. Goodhue selected it for its durability, despite opposition from politicians who wanted him to specify a locally quarried sandstone. (It turns out that the sandstone, used on other buildings in the region, is soft and has a tendency to separate into its bedding plains.) The stone company from which the limestone was purchased set aside portions of its quarry for the exclusive use of the capitol project, resulting in an especially homogeneous color across the building. The stone ranges from four to 12 inches in thickness.

Beneath the stone is a layer of brickwork. The masonry rests on steel shelving, part of the sophisticated steel framing. An extremely cement-rich mortar, composed of one part white Portland cement and two parts sand tempered with hydrated lime, bonds the masonry, while galvanized-metal anchors tie the stone and brick. There is also a cavity wall made of brick and plaster.

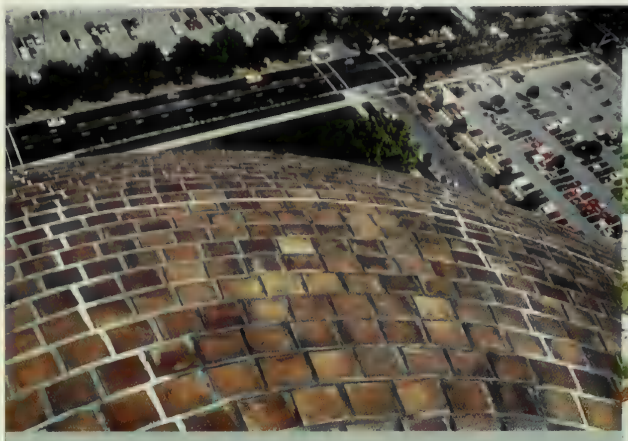
Goodhue and Balcom knew the steel frame would contract with the building's weight and the masonry would expand and move as it took on moisture. Pressure-relieving joints, inserted horizontally into the stone joints at each floor, were designed to allow the masonry and steel to accommodate these conflicting forces. Made of a kind of corrugated lead, the joints were designed to crush in order to absorb movement and building stress.

The first of many problems is that these relief joints penetrate the stone, but not the brick. With no room to move, enormous compressive forces quickly mounted within the masonry walls, causing them to crack. Because of the strength and tenacity of the mortar, the stone and brick act as a single unit. The situation is exacerbated by the ties between the masonry; as the frame compresses, the masonry is pulled, causing stones to spall and crack. In addition, the mortar between the stone and brick joints is harder than the surrounding masonry, so there is no give, causing related cracks in the stone.

While the cracking is worst on the tower—approximately 25 percent of these stones are damaged—there are cracks on the lower part of the building as well. These are the result of wind-driven water entering the brick substrate and causing it to expand. The stone units, larger on this portion of the building, don't expand when exposed to moisture. The

GLOSSARY

Spall A fragment or flake broken from the surface of the stone.
Hairline crack An extremely thin crack.
Medium crack A crack about 1/32 inch wide.
Wide crack A crack more than 1/32 inch wide.
Pointed crack A crack that has been ground out and filled with mortar.
Sealed crack A crack filled with sealant or epoxy.
Delamination A separation of part of the stone along a plane roughly parallel to the surface.
Stain Visible surface contaminants on the stone.
Organic growth Living biological contaminants such as algae, mold, or mildew.
Dutchman A previous stone panel repair which entails removing a portion of the stone panel and replacing it with a closely matched new stone.
Sealed mortar A mortar joint filled with sealant or epoxy.
Pointed mortar joint A mortar joint that has been ground out and repointed after completion of initial construction.
Efflorescence Water-soluble salts on the surface of the stone that originated within the stone, mortar, or other material within the wall and migrated to the surface.





RAPPELLING FROM THE SOWER, A STATUE atop the capitol dome (left), field inspectors performed visual inspections and applied nondestructive testing methods to examine cracks in the dome (far left) and assess the tower's condition.

bricks, however, expand significantly, resulting in pressure on, and ultimately fractures in, the stone.

Based on the high proportion of cracks that occurred after the 1973 renovation, WJE and BVH realized that unless steps were taken to alleviate the stress, the building was in danger of cracking apart. Meanwhile, water, leaking into the walls from the cracks, was creating more insidious problems.

Technology meets masonry

While WJE conducted its fieldwork, BVH was transforming the original shop drawings for the stone into CAD drawings. The originals contained different drawing styles, which indicates various draftsmen in the stone fabricator's office were involved in their preparation. After working with the drawings for some time, BVH recognized that one draftsman was noticeably inaccurate. The discovery meant the architects had to take extra care in interpreting the plans. But it also reinforced the need for accuracy and thoroughness as vital components of the new, computerized database, if only to make future restoration efforts easier.

For historical purposes, consistency, and future reference, the original naming conventions established in the shop drawings were used to create the CAD drawings. By using the features of a relational database, each drawing could be identified by many different names and still tied to its original designation.

When examining the existing documents and considering the size of the building, it was evident that there would be a substantial amount of data. A computer with adequate "horsepower" was required to complete the job. In 1995, the optimum model for the job was a Pentium 133 with 32 megabytes of RAM and a one-gigabyte hard disk. All of the machines used on the project were part of BVH's office network, which allowed several staff members to work on the project simultaneously.

The software packages used in 1995 are somewhat dated today. However, updated versions of these would still be appropriate. The CAD software that created the computer drawings was Microstation 95. Microsoft Access 7.0 was the main database software, while Microsoft Visual FoxPro 3.0, another database software package, was used early in the design of the database tables. Realistic images of the capitol were created and enhanced from the CAD data with Adobe Photoshop 3.0. All of the software used has been upgraded and revised, but each package was chosen to enable the data contained to withstand the test of time.

The database allowed the architects to generate tables that quantified all instances of stone distress.

With the vast quantity of data, it was necessary to create several new software tools to help ease the burden of some of the repetitive tasks, such as drawing each stone on the building facade. Microsoft Visual Basic 4.0, a simple programming language, was used to create several of the custom tools. Because of the large quantity of stones to input (35,861), it was critical to maintain consistency. Software was written to create the graphics for the stone, coordinate the stone mark number, assign the proper layers for the CAD drawing, and choose the proper screen colors.

Once a baseline CAD drawing was finished, the stone distress data from the field survey sheets was overlaid. From those composite

STONE DISTRESS SUMMARY TABLE

DISPLACEMENT	3	0%
DUTCHMAN	4	0%
FACE DISTRESS		
DELAMINATED	2	0%
PATCHED SPALL	797	2.02%
SPALL	402	1.12%
TOTAL	**1,201**	**3.35%**
MORTAR CRACK	575	552.08
MORTAR SEALED	120	87.46
PREVIOUSLY POINTED	862	601.77
TOTAL	**1,557**	**1,241.31**
EFFLORESCENCE	49	0.13%
ORGANIC GROWTH	1	0%
STAIN	523	1.45%
TOTAL	**573**	**1.58%**
CRACK HAIRLINE	763	480.46
CRACK MEDIUM	224	167.56
CRACK POINTED	97	83.94
CRACK SEALED	1,571	1,526.89
CRACK WIDE	32	36.90
NOT ORIGINAL JOINT	3,641	9,259.60
TOTAL	**6,328**	**11,555.35**

SOURCE: COURTESY BAHR VERMEER & HAECKER



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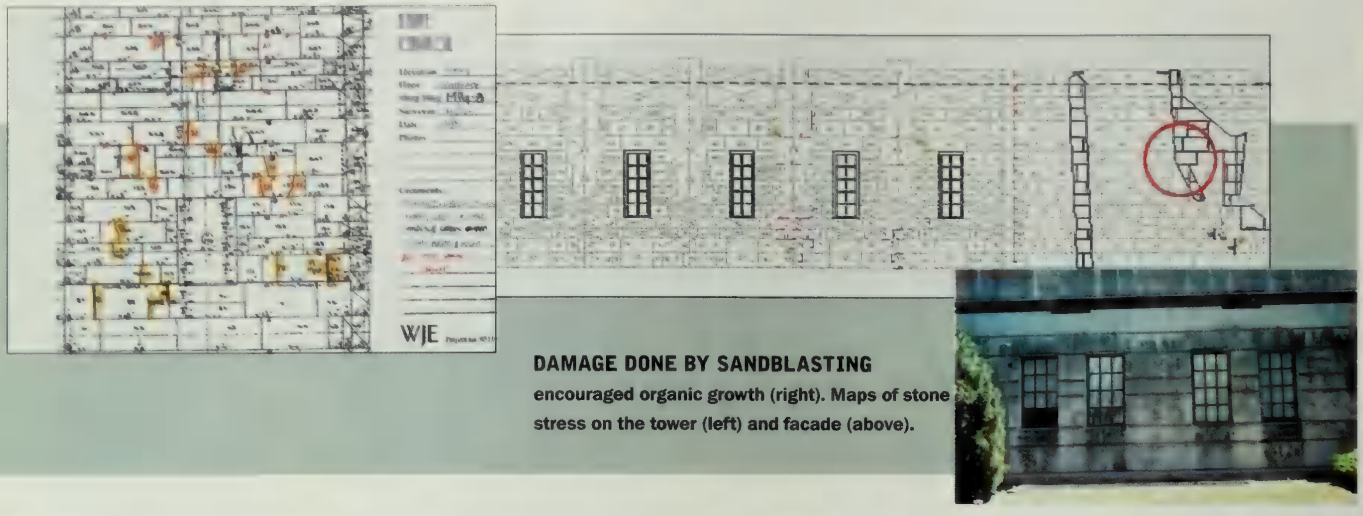
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CIRCLE 57 ON INQUIRY CARD



DAMAGE DONE BY SANDBLASTING
encouraged organic growth (right). Maps of stone stress on the tower (left) and facade (above).

CAD drawings, the relational database, which allows the linking of several tables of different data, was created. It consists of a full list of the CAD drawings, which is linked to a full list of each stone on those drawings, which in turn is linked to a list of all stone distress discovered during the exterior survey of the building. The linking allows data to be joined in a one-to-many relationship without having to duplicate data each time.

Ultimately, the real convenience of such a database was in accessing and organizing the information. This helped the team to quickly study, comprehend, and diagnose the problems with the capitol. Large-scale plots with overlays of cracks and the estimated date of occurrence helped reveal many of the building's basic problems.

The computerized information and software, created and stored in standard formats, will be available to the state so that it can be used for future phases in the project. The CAD drawings and the relational database form a strong beginning for the design development phase of the project and the contract documents required to complete the work. In addition, many conclusions from the database are being used to secure funding of the project.

Tables were generated describing the size, shape, and number of each stone in the building facade.

STONE DISTRESS TABLE EXCERPT

DATABASE FIELD	DESCRIPTION
DGNMK	DRAWING NAME AND STONE MARK NUMBER ARE COMBINED TO JOIN THE DATABASE TABLES. THIS IS A UNIQUE FIELD THAT IS NOT REPEATED WITHIN THE DATABASE.
DGN	THIS IS THE CAD FILE NAME.
MK	THIS IS THE STONE MARK NUMBER FROM THE ORIGINAL STONE-SHOP DRAWING. WHEN THERE ARE DUPLICATE NUMBERS, A NEW SUFFIX IS USED.
LEVEL	THE CAD LEVEL ON WHICH THE DISTRESS IS LOCATED. ALSO USED FOR QUALITY REVIEW.
DISTRESS TYPE	THE TYPE OF DISTRESS AS IDENTIFIED FROM A LIST OF 17 DISTRESS TYPES, INCLUDING SPALL, DELAMINATION, AND STAIN.
LINEAL FEET	THE LINEAL DIMENSION OF THE DISTRESS. IN THE CASE OF AN AREA, SUCH AS A STAIN, THIS IS THE HORIZONTAL DIMENSION.
AREA	THE AREA OF THE DISTRESS, SUCH AS A STAIN OR A SPALL.
PERCENT	THE PERCENTAGE OF THE STONE THAT IS DISTRESSED.
HEAD/BED JOINT	IN CASE OF DISTRESS WITH A MORTAR JOINT, THIS IDENTIFIES WHETHER IT IS IN A HEAD OR BED JOINT.

SOURCE: COURTESY BAHR VERMEER & HAECKER

Making repairs

In June 1996, WJE and BVH generated the condition report, based on field research and computer analysis, which details distress and decay with the capitol facade, diagnoses the causes of distress, and offers suggestions for treatment. These include:

Modifying the relief joints to make the overall behavior of the tower more like a steel skyscraper. This will involve temporarily removing some stone and redesigning the brick behind it.

Repairing the stone masonry on the facade and ornamentation by carefully disassembling and repairing the damaged elements. Limestone blocks will be conserved and reused when possible to retain the homogeneous color of the facade.

THE DATABASE ALLOWED THE TEAM TO QUICKLY STUDY AND COMPREHEND THE PROBLEMS WITH THE CAPITOL.

Selecting an appropriate cleaning technology to remove organic growth from the facade. Cleaning of the building base may be necessary every 10 to 15 years, while cleaning of the tower may be needed only every 30 to 40 years.

Tuckpointing as necessary, using the least destructive method of removing mortar from the existing joints. The texture and color of any new mortar will closely match the original. However, this time a softer mortar is proposed.

The building is scheduled to be wrapped in scaffolding this fall, weather permitting, so contractors can begin work on the turrets and walls of the promenade and Memorial Room on the 14th floor, an area that includes an observation deck open to the public. Repairs to this area were identified as top priority because of safety concerns—there is a possibility that a section of stone could fall. Also, because this level is open and exposed to the weather on all sides, it is among the most deteriorated sections.

The work, which is likely to continue over nine years, will progress down the tower and, finally, encompass the base. The state has taken a long-term view toward building preservation, assuming that the Nebraska State Capitol is to have a useful life span well into the next millennium. It also plans to inaugurate an ongoing program of building conservation. ■

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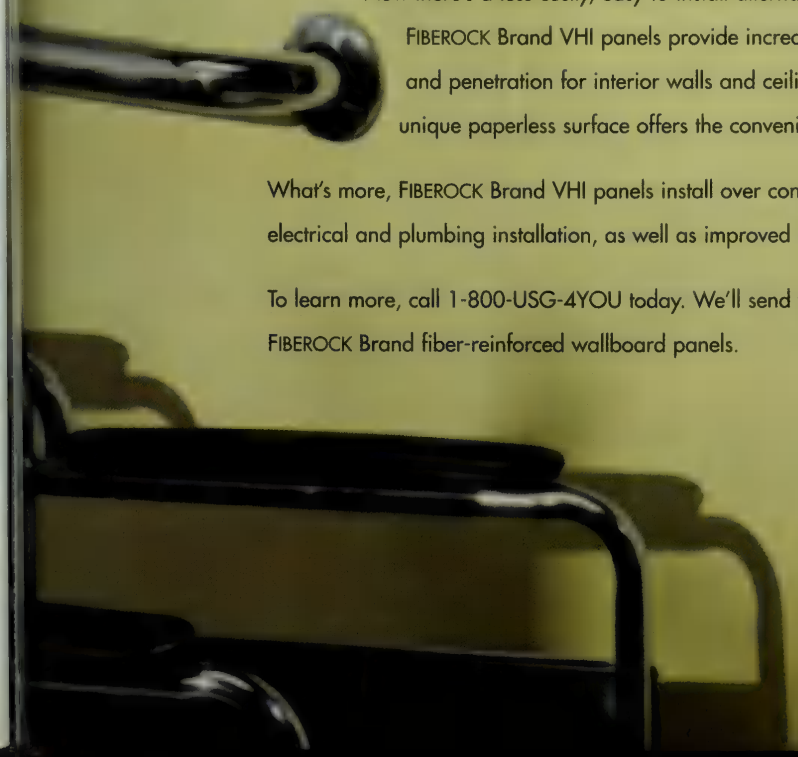


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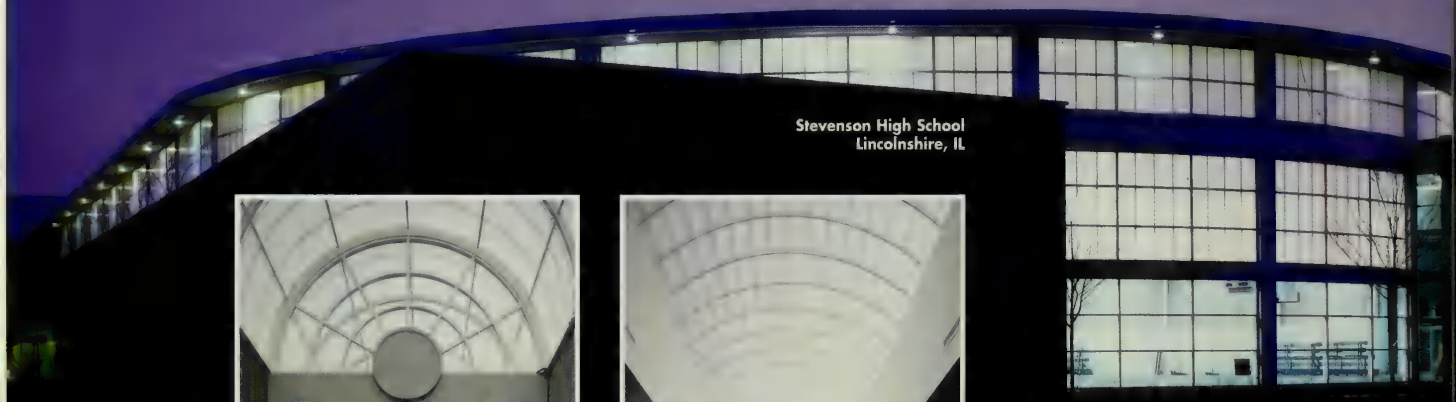
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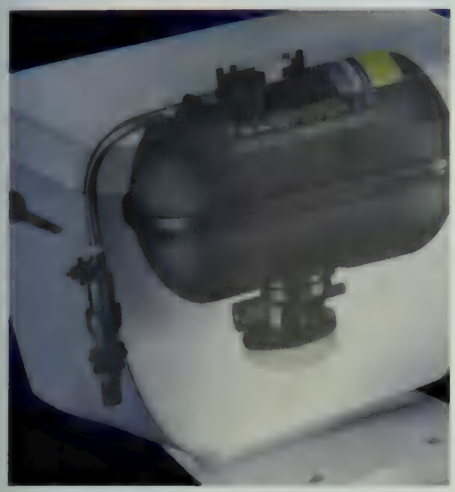
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CIRCLE 59 ON INQUIRY CARD

A Tale of Two Water Closet Technologies



by Joseph M. Smaul, P.E.

It was while working as the head of plumbing engineering and overseeing the HVAC for hotels on the East Coast that I became involved with pressurized water closets. We just finished a 600-room facility and we were preparing to go to work on the next 400-room project, when a letter crossed my desk from the major fixture manufacturer for the new project. This fixture manufacturer — who was different from the one we used on the 600-room hotel — suggested that we do not use gravity-flushing closets in the hotel we were engineering. Instead, the manufacturer recommended his line of pressure-assist water closets for a variety of reasons.

The question immediately arose in my mind: why? If pressure-assist is the standard for hotels, why didn't the other manufacturer for the 600-room hotel recommend it?

I was assigned the task by the principals of my company to find out what this was all about, so I called the head of maintenance engineering at the 600-room hotel where we had specified and had 1.6 gravity-flush water closets installed. I asked him how these gravity units were working out.

I still recall how matter-of-fact he was when he calmly said, "I'm really glad you called. We get about 75 to 100 calls a week to unclog these toilets. It has become pretty routine now. I think ever since they limited the water usage to 1.6 gallons per flush, that's when the problems started. We leave plungers right in the rooms now, so we don't have to be carrying them down the halls in front of the guests. I guess there isn't much we can do about it!"

I was looking at the other manufacturer's letter that recommended pressure toilets on my new project as I listened to his comments. He continued, saying, "We are experiencing tremendous guest dissatisfaction over this clogging, double flushing, and poor performance. But say, I've heard of something that might be worth investigating as long as I have you on the phone. I think they call it pressure toilets. Can you find out if there's anything to this? I've called the fixture manufacturer, too, and they said they are looking into the situation for us. There might not be anything we can do except live with it."

I said I would see what I could do, and hung up the phone. I then called the original manufacturer we used at the 600-room hotel. It turned out that he was already well aware of the clogging problems at the hotel...that he was in the process of re-engineering his fixture, and that he would step up and resolve the situation for the maintenance engineer's and my own satisfaction.

I decided I needed more information before I made our final recommendation between gravity and pressure-assist, so I researched further by calling maintenance engineers around Las Vegas hotels. I found out that they were either installing pressure-assist, or replacing gravity with pressure-assist. One of the casinos actually took out ALL of their gravity toilets and replaced them with pressure-assist! Since they started using pressure, they were able to reduce their service factor on toilets to zero.

I asked around some more, and I heard from people who bought new homes that were disgusted with the 1.6 gravity because of flushing two or three times. Then I remembered that my own relative had a closet off the den with 1.6 gravity that even the kids were not allowed to use because of performance problems. They actually have to go upstairs to the second level toilets.

Well, all of this made our decision easy, and we recommended pressure-assist toilets.

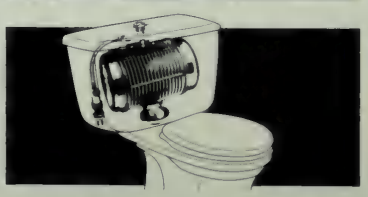
But I also came upon something from my study that was truly amazing: it didn't matter which fixture manufacturer was specified for pressure-assist toilets. All the manufacturers were using the same pressure-assist technology in their pressure-assist fixtures. That technology? Sloan's *FLUSHMATE*® pressure-assist operating system.

Of course, you can't make a statement that for all conditions, pressure-assist works best. However, if performance is the criteria, fixtures with Sloan's *FLUSHMATE*® pressure-assist operating system do, in fact, work the best.



About Joseph Smaul, P.E.

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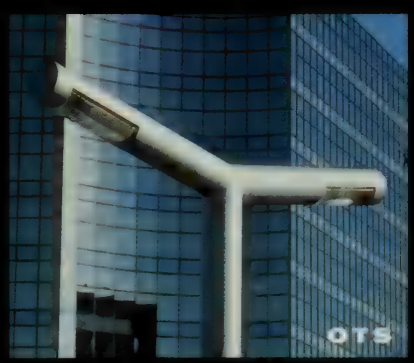
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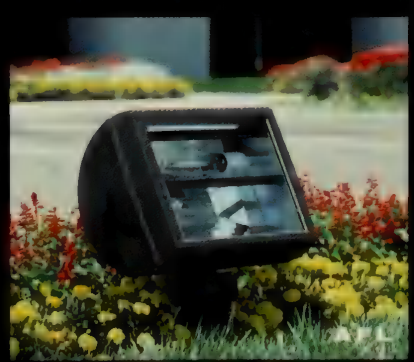








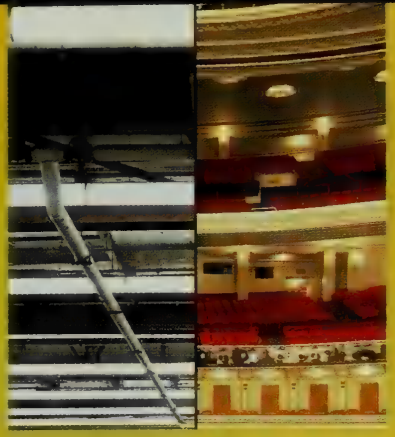




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LIGHTING...

In their use of technology, two projects in this month's Lighting section—the restoration of the War Memorial Opera House in San Francisco and the lighting of an aircraft maintenance facility at Hill Air Force Base, near Ogden, Utah—could not be more different.

Most of the opera house's new lighting uses tried-and-true incandescent and halogen lamps, where electricity is passed through filaments that give off light when they are heated. The maintenance building, on the other hand, uses a relatively new technology: a magnetron that bombards a spinning glass sphere filled with sulfur and argon gas to produce extremely bright, warm-colored light.

These two projects' differences go far beyond the technical. More control is needed in lighting fixtures used in the theater than perhaps anywhere else. They must be dimmable on demand, able to produce white light that can be gelled to create any color, and capable of being focused or diffused by the lighting designer. They must be compact, reasonably lightweight, and durable, to withstand being taken down and reinstalled hundreds of times over their lifetime. Although the demands may sound extreme, those who know theatrical lighting don't see them as mysterious.

The sulfur lamp, by contrast, is a new creation, not many steps away from the workbench. The color of the light provided by the lamp is good, the output is very high, and it has no filaments or electrodes to burn out. But the fixtures themselves are big and still quite costly. In addition, the light is so intense that it may be challenging for the lighting designer to control: to distribute it evenly, to put it where it is needed, to keep it from being overpowering. But that intense light is also what makes the sulfur lamp perfect for use in a high-bay aircraft maintenance facility.

The wonderful thing about technology in the current era is that the cost of a product tends to drop rapidly as soon as the idea takes off. And when something becomes truly successful, there is always someone who wants to make it smaller. When I started writing about lighting, the 250W metal-halide lamp was relatively new. Within a couple of years 100W, then 70W, then 35W metal-halide lamps were on the market. MR16 lamps that were fairly small to start with were followed by tiny MR11s. Compact fluorescents that were at first too large to screw into table lamps soon assumed several ingenious shapes that allowed them to fit, without sacrificing light output.

All of this makes me believe that it won't be long before the sulfur lamp becomes more affordable and begins to shrink. Today's long-lasting sulfur lamp may be no different from the vacuum tube that was later superseded by the transistor and, after that, by the microchip. Maybe one day it will become so small that it will be found in all sorts of applications not dreamed of today, even the theater. Wouldn't it be wonderful if that big spotlight focused on Placido Domingo didn't suddenly burn out during an aria in Act II? Hope for the best, dear reader, and think small. —Charles Linn, AIA

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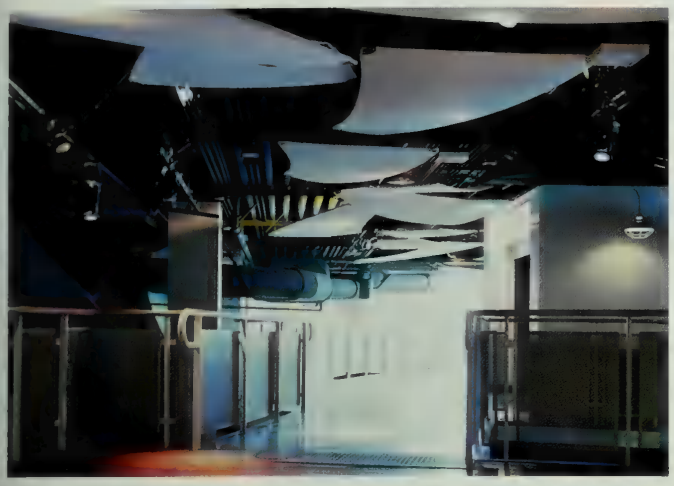
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CREATIVE USES



FABRIC DIFFUSERS OFFER UNUSUAL LIGHTING FOR SPECIFIC SITES

Koryn Rolstad's work lies in a gray area. "It is somewhere between architecture and industrial design," says Rolstad, whose Seattle-based firm, Koryn Rolstad Studios/Bannerworks, Inc., designs, engineers, and manufactures fabric structures for architectural projects. Rolstad, who has a background in architecture as well as the fine arts, counts lighting, acoustics, and the visual enhancement of large spaces among her areas of expertise.

Industrial design usually implies design of a product, such as a light fixture, which is then produced and marketed. Rolstad works differently, producing site-specific pieces for individual architectural projects. Her custom light diffusers have been used on projects as varied as restaurants, museums, lobbies, and sports stadiums.

Stir Crazy, a pan-Asian restaurant located in an upscale shopping mall in Northbrook, Illinois, is a large, 5,000-square-foot space centered around an open kitchen, where chefs stir-fry dishes to order. The design, by the Chicago firm Lieber Cooper Associates, is a creative collage of natural materials such as wood, glass, and bamboo and beautifully crafted details such as copper cladding for pillars and a glass mural.

The high ceiling in the restaurant called for a creative lighting solution. Inspired by Chinese lamps of handmade paper, the designers decided to use light diffusers. Using a hoop to stretch the diffusing fabric was suggested by the craft of embroidery, which Rolstad learned while growing up in a convent in Southeast Asia.

Her large, cloudlike diffusers serve three purposes in the restaurant. First, they diffuse the light of the ceiling-mounted track lighting, creating a warm glow that enhances the honey- and maple-color palette of the restaurant. Installed around the central kitchen, they help to orient the visitor in the large space, which is broken up into separate areas. And, finally, they work as environmental sculpture.



The circular, three-dimensional units are eight feet in diameter at their widest. The spiral hoop frames are constructed of aluminum bar held together with off-the-shelf bolts and acorn nuts. The hanging system consists of four stainless-steel cables tied by quick-links at the top, allowing the diffuser to hang from one point.

In creating her diffusers, Rolstad used commercial-grade, fire-retardant polyester fabric, which is dense but translucent. Although they are quite large, the diffusers are lightweight and can be broken down into smaller elements for shipping. They were assembled on site and the fabric, which has an elastic edge, was then snapped on.

In the Odyssey Maritime Discovery Center, Rolstad's diffusers serve a similar purpose. The museum, a shiplike structure built on the Seattle waterfront, is an interactive center, designed primarily for children, that explores the past and present life of the Northwest coast.

Rolstad's diffusers have been installed in a narrow, 60-foot-long passageway between two galleries. The space was dark and unattractive, with a number of pipes running below the passage's low, seven-and-a-half-foot ceiling. Although dropping the ceiling was considered, the designers ultimately decided to invest in light diffusers.

Rolstad's solution took the form of trapezoidal fabric panels curved both in plan and elevation to create an image of sails billowing in the wind. The panels were inserted into an aluminum frame and installed at different angles. Back-lit with ceiling-mounted spots, the diffusers serve as a sculpture that leads the visitor from one gallery "deck" to the next.

The eight-foot panels, mounted close to the ceiling, are also lit from below. The lighting designers for the project, C. E. Marquardt Lighting Design, have used the diffusers as a fabric screen. Incandescent halogen lights with color gels, controlled by a portable dimmer, project a changing array of colors on the panels.

In both the restaurant and the museum, the diffusers were an economical choice compared to the cost of installing a new ceiling, and they offered a sophisticated lighting design that used basic, off-the-shelf lamps and fittings. *Nayana Currimbhoy*



Koryn Rolstad's custom light diffusers were used at the Odyssey Maritime Discovery Center in Seattle (top left), and at Stir Crazy, a restaurant in Northbrook, Illinois (above and top right).



A FINE BOUQUET OF LIGHTS FOR THE FAR NIENTE WINERY

Visitors drive up a dark path for half a mile before arriving at the ornate iron gate of the Far Niente Winery. Framed in light, the gate is dimly illuminated, to give the eyes time to adjust. In the background, a shrub sculpted in light stands in relief against the darkness. The message to the visitor is clear: a mysterious wonderland of light and shadow awaits inside.

The Far Niente Winery, in northern California's Napa Valley, was built in the late 19th century and later abandoned during Prohibition. It was purchased in 1987 by Gil and Beth Nickel, who began to restore the winery building and the eight-acre grounds around it.

The landscape lighting was designed by Michael Hooker and Janet Lennox Moyer, partners in MSH Visual Planners. The main areas of focus are the winery building and two gardens—the Chardonnay Garden and the Cabernet Terrace—where private parties, benefits, and auctions are held.

"The philosophy behind the lighting design was to sculpt the two gardens out of the darkness and then to create a low level of lighting to get people from one area to the next," says Moyer, who also teaches at the Lighting Research Center at the Rensselaer Polytechnic Institute in Troy, New York.

The winery building itself is lit with clear, 70W high-pressure sodium (hps) lamps; 50W hps lighting on the stone retaining walls anchors the view. Quartz halogens illuminate a row of olive trees in the foreground to create contrast and depth. The winery, which is always lit at night, is visible from the highway, providing a strong marketing statement for the company.

Lighting for the rest of the gardens, which is turned on only for special events, is primarily tree-mounted. Putting the fixtures in the trees makes them easier to aim and maintain and minimizes the number of fixtures needed.

In the Chardonnay Garden, the lighting is focused on the food bar and the wine bar. Miniature lamps graze the bars' stone counters, drawing guests' attention to the food and wine. Downlighting in the trees provides the caterers with task and general lighting. MR11 and MR16 lamps comprise the bridge, lawn, gazebo, and tree-canopy downlighting for these areas. Accessories such as linear-spread lenses and screens provide multiple effects while using the same lamp. The light on the dance floor between the bars, dappled through the trees, is dimmer.

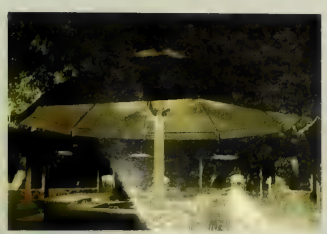
In the Cabernet Terrace, the food and wine counter is again the focus of the lighting, which consists of 35W MR11 luminaires mounted in an umbrella over the counter. Downlighting provides the task lighting, while uplighting gives the umbrella a surreal glow. Trellis-mounted downlights wash the lawn and provide fill lighting between focal areas. Large oak trees are illuminated from above and below to add background and depth around the garden.

In lighting a large area like this one, cost and maintenance are primary considerations. Rather than providing spotty lighting throughout the estate, the designers opted for mini-compositions of light that accentuate special features, provide a visual connection from one area to another, and serve to direct visitors' movements.

Except for the winery, the entire project was lit with MR11 and MR16 lamps in 20W and 35W, which simplifies maintenance. Areas of the project are relamped as a group, rather than individual lamps being replaced one by one as they burn out. Running costs are also kept to a minimum with the use of low-wattage lamps. Since the site is mostly dark, it requires lower light levels, because the eye adjusts to the dim light. Using low-wattage lamps reduces the electrical bills, and slight undervoltaging and infrequent use results in multiyear lamplife.

The installation documents were quite novel. "We needed visual documentation of the trees," says Moyer. So she took Polaroid photographs of each of the trees to be lit, and indicated on the photos where the lamps would be positioned, and what the wattage of each lamp would be. This visual record has also proven helpful for maintenance. *N.C.*





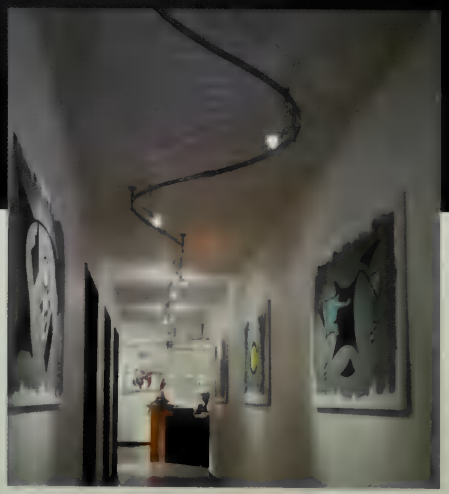


Guests enter the Far Niente Winery through a dimly lit gate (far left, top) before coming upon the winery building lit with clear hps lamps (above). In the Cabernet Terrace (far left, bottom), the umbrella conceals downlights for the serving counter, and uplights make the umbrella glow. In the Chardonnay Garden (left), MR11 and MR16 downlights graze the stone food and beverage counters.

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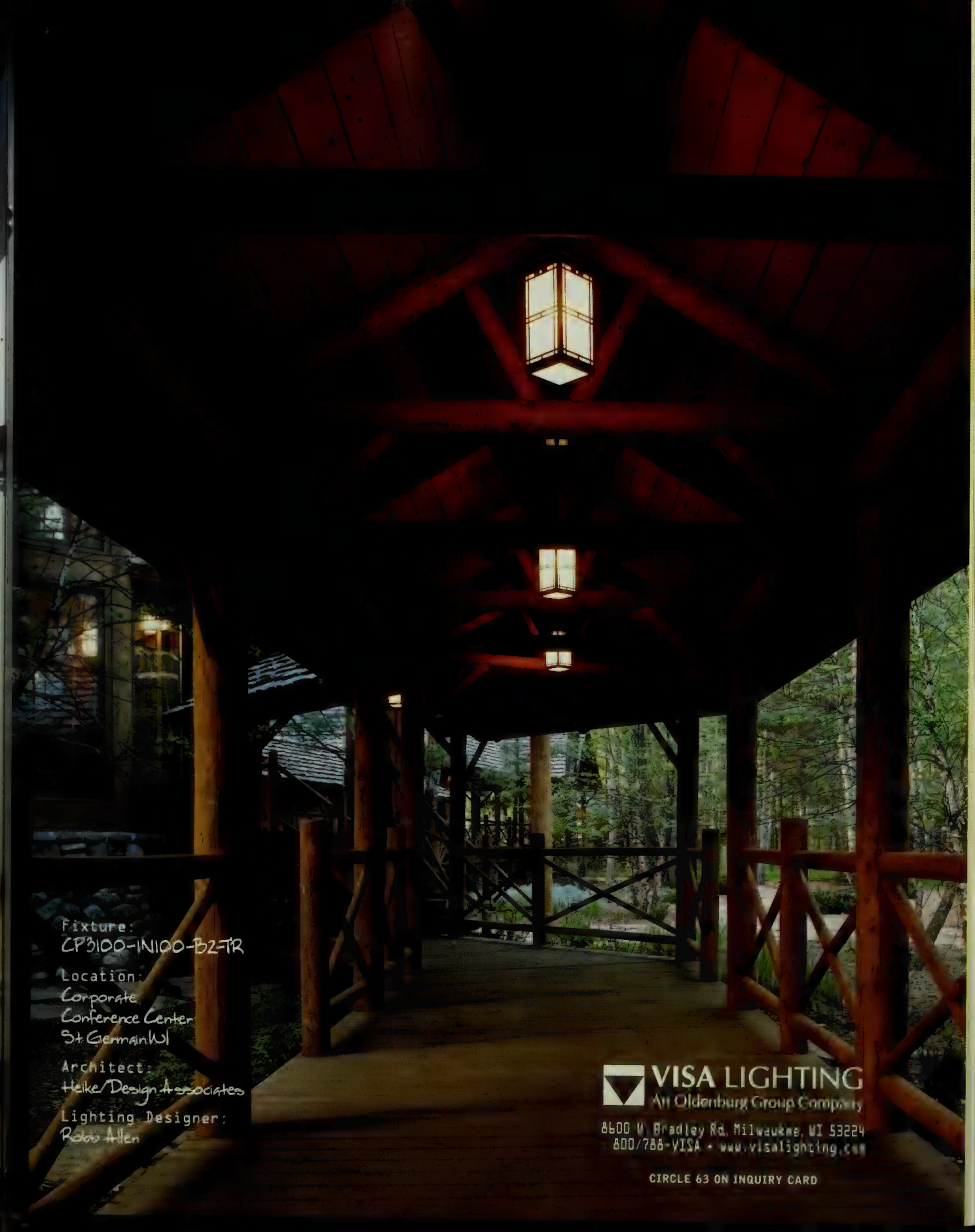
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CIRCLE 64 ON INQUIRY CARD

War Memorial Opera Restoration Gives Building a Second Chance To Sing

by William Weathersby Jr.

When André Previn's opera adaptation of *A Streetcar Named Desire* by Tennessee Williams premiered recently at the War Memorial Opera House in San Francisco, it signaled that the venerable theater was back on track as a world-class performing arts venue. But the drama experienced by theatergoers is not limited to the stage: after years of neglect, an $86.5 million restoration, completed last year, has returned the Beaux-Arts theater to its former glory while completely upgrading its infrastructure and technical systems. Providing the final grace note is restored architectural lighting by San Francisco–based consultants Auerbach + Glasow.

While opera had been part of San Francisco's culture since shortly after the Gold Rush, it was not until 1918, when plans for a memorial to honor servicemen returning home from World War I were drawn up, that the city finally determined it would have an opera palace. When completed in 1932, the War Memorial consisted of two nearly identical structures sitting side by side, anchoring the Civic Center: the opera house and the veterans building, both designed by architect Arthur Brown, who also designed City Hall across the street. Architect G. Albert Lansburgh orchestrated the opera auditorium's lavish interiors.

The opera house was acclaimed as the largest and best-equipped facility of its day. *Time* magazine wrote that it was "easily the most attractive and practical building of its kind in the U.S." As home to the San Francisco Opera, Ballet, and Symphony, until the latter moved to a newly constructed hall across the street in 1980, the theater charmed patrons for decades with its splendid acoustics, grand stage, and elegant auditorium. But as the technology of theater production advanced after World War II, the venue's theatrical systems grew outdated and its support spaces became overburdened. The hall's interior details also began to show their age.

As if on cue, fate intervened in 1989 with the Loma Prieta earthquake. Damage to the War Memorial was largely cosmetic—fallen plaster and cracked paint—yet when San Franciscans passed a bond measure to seismically upgrade a group of civic buildings, $49.5 million was earmarked for the opera house. The privately funded Committee to Restore the Opera House (CROH) raised the balance of the restoration budget for technical and back-of-house improvements, with the War Memorial board adding another $7 million to enhance public amenities.

The San Francisco Department of Public Works Bureau of Architecture was the architect of record for the 18-month restoration project, including the technical improvements. The San Francisco office of Skidmore, Owings & Merrill collaborated with theater consultant Auerbach + Associates on the design of the technical infrastructure and production systems, while Carey and Company of San Francisco served as preservation architect. Auerbach + Glasow, the architectural lighting design division of Auerbach + Associates, restored the existing lighting in the auditorium and lobby and overhauled the electrical and dimming systems throughout the building.

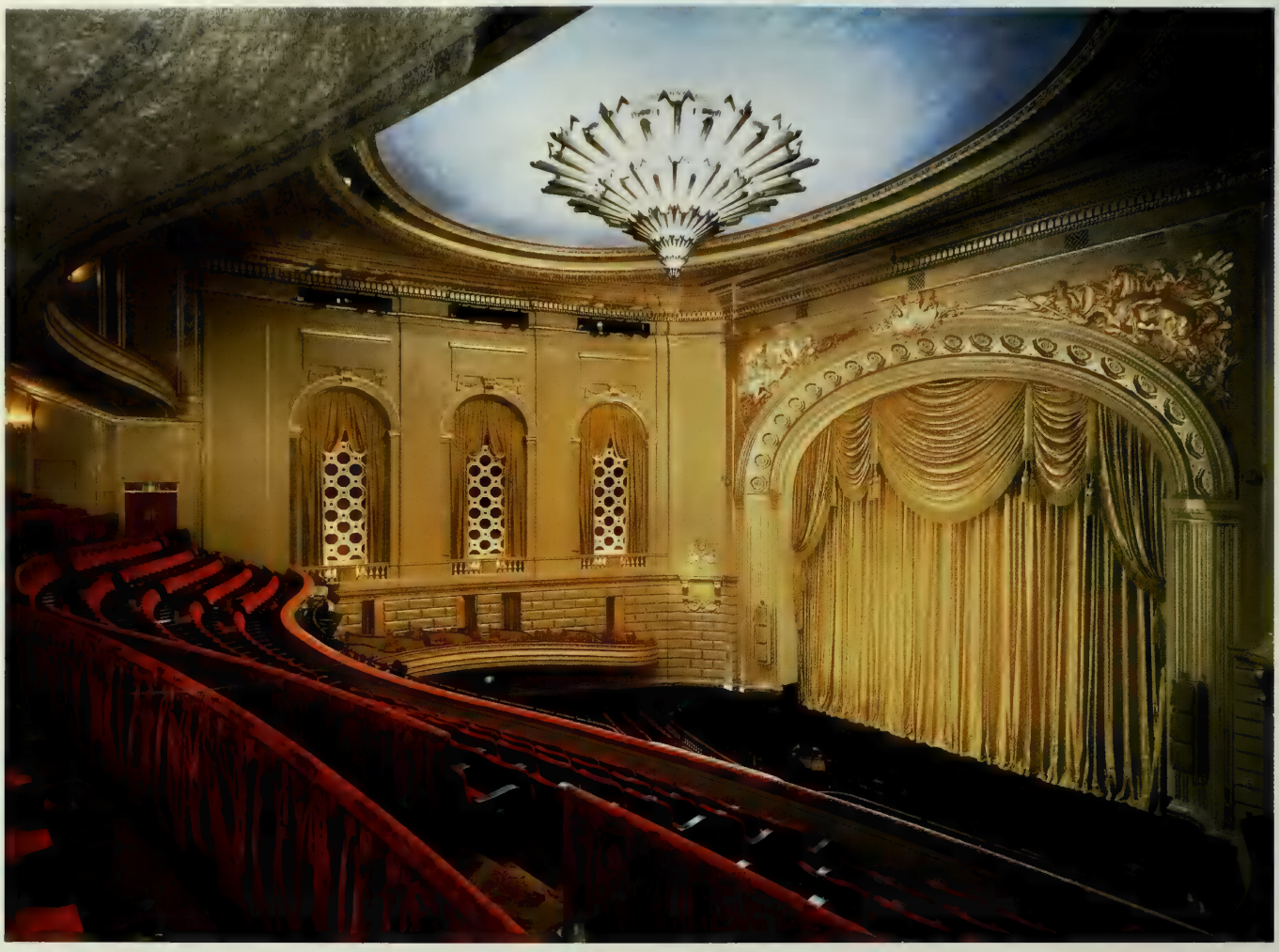


The relighting of the San Francisco War Memorial Opera House was a happy byproduct of a seismic upgrade.

"When we prepared our initial report on the state of the theater, we discovered that a third of the original circuits weren't grounded," says principal lighting designer Larry French. "The first step of the project was to install a ground system for the original house circuits. We also

William Weathersby Jr. is a freelance writer based in Westport, Connecticut. He has written about lighting, interior design, and architecture for many publications and is the author of the forthcoming book The Pierre: A Celebration of Landmark Style.

Project: *War Memorial Opera House, San Francisco*
Owner/client: *City of San Francisco; Committee to Restore the Opera House*
Architect of record: *City of San Francisco Department of Public Works Bureau of Architecture—Tara Lamont, project manager; Andrew Maloney, project architect*
Consulting architect: *Skidmore, Owings & Merrill*
Preservation architect: *Carey & Co.*
Lighting designer: *Auerbach + Glasow—S. Leonard Auerbach, principal; Larry French, project designer; Diane Waschow, project manager*
Consultants: *Auerbach + Associates—S. Leonard Auerbach, Larry French, Diane Waschow, Darrell Haber, Michael McMackin, Adam Shalleck, Kyle Smith (theatrical); Paoletti Associates (acoustics)*
San Francisco Opera project team: *Robert Priest, project manager; Thomas Munn, director of lighting; Lynn McKee, master electrician*
San Francisco Ballet project team: *Michael Abramson, project manager; Lisa Pinkham, lighting designer; Dennis Hudson, master electrician*



discovered an incredible tangle of wiring. Over the years technicians had poked holes through the proscenium wall for cable access. There were layers of loose cable lying atop each other, and some circuits had been abandoned. It was our job to completely rebuild the electrical and technical infrastructure."

A centerpiece of the lighting project was restoring the auditorium's grand chandelier. When the opera house opened, the *San Francisco Call* described how "a ceiling of solid blue, illumined by hidden lights, clasped to its bosom the bright star-like jewel of a great chandelier." By the 1990s, the once-beautiful fixture was dull and lifeless and the blue ceiling had faded to muted gray. When researching the fixture's original design in city archives, the project team discovered that lamps inside the chandelier were intended to uplight the ceiling though they had not functioned for decades. A photometric simulation revealed that the uplighting had once provided about 80 percent of the general lighting in the theater. As a result, light levels in the auditorium had deteriorated significantly. "The main floor was down to about half a footcandle, while the original design criterion was somewhere just under 10," French says.

Originally designed and installed by the Roberts Manufacturing Company of San Francisco, the six-tier chandelier measures 25 feet in diameter and is 14 feet deep. The starburst design features solid cast-aluminum vanes attached to a steel frame. During restoration, additional seismic cross-bracing was added to the core of the chandelier's framework, which is welded directly to the building's structural-steel roof.

Sixty-five years of accumulated grime was cleaned from the exterior of the chandelier, restoring the luster of its polished aluminum surfaces and revealing the original amber-hued detailing along the chandelier's edges. The chandelier's bottom three tiers, which can be lowered to the floor for relamping, were removed and restored offsite. The rest of the fixture was cleaned and repaired in place. Scott Architectural Lighting/Taylor Stokes restored and rewired both parts of the chandelier and reinstalled the lower portion.

The restoration of the auditorium allowed lighting designers Auerbach + Glasow to create slots for lamps that uplight side arches and illuminate draperies and gilded plasterwork, and to install a new theatrical and architectural control system (above and opposite bottom).

The company fitted the upper portion of the chandelier with new lift-out socket assemblies to make relamping easier. This work is accomplished by a lighting technician who crawls down an access ladder from the ceiling. The chandelier, which originally housed 540 standard A-lamps, now has 44 350W T4 lamps set in asymmetric throw uplights, 560 90W halogen A-lamps in the four upper tiers, and 21 50W halogen A-lamps in the lower two tiers. "The slightly whiter, crisper halogen A-lamps within the chandelier and dome pendants offset the warm glow of the traditional sconces, which are illuminated with incandescents,"



The uplights in the chandelier were restored, raising light levels at the floor ninefold.

French says. "The cooler color of the repainted blue ceiling also prompted us to specify the halogens." The restored fixture increases the overall lighting in the auditorium by nine times the previously existing level. The chandelier's circuits are connected to new architectural dimmers located in the same room as the theatrical dimmers, providing full voltage to the sockets for the first time in many years.

Restored architectural features in the auditorium were enhanced with special lighting. New slots were created in the bay arches along the side walls to accommodate front-of-house theatrical lighting positions. The slots allowed French to restore the original lighting that had been missing from the side bays for nearly 50 years. Now MR16 striplights accent the gilded grillwork and draperies within the recessed arches.

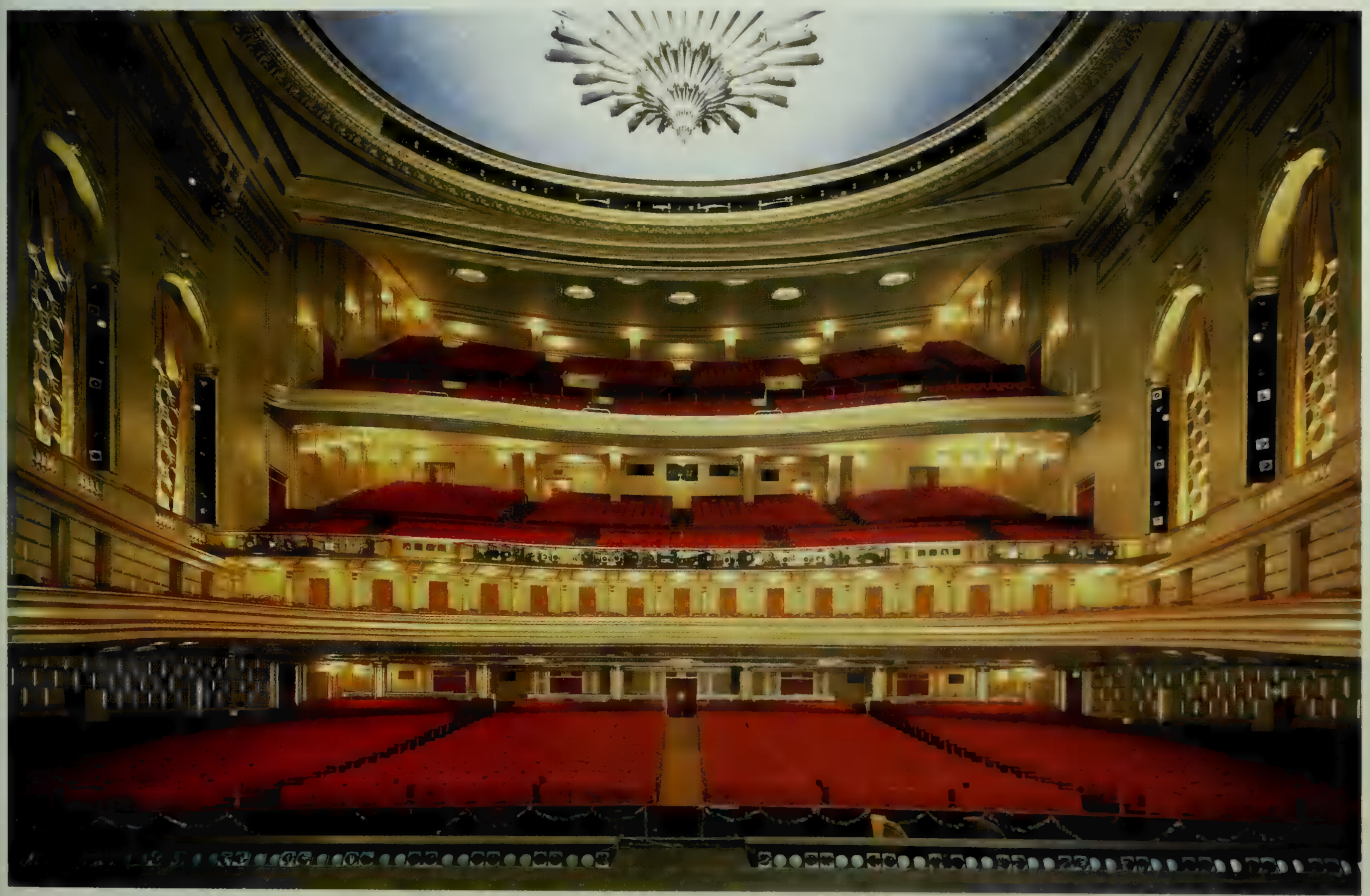
PAR cans, fresnels, and ellipsoidal reflectors are employed as accent lights in the auditorium. Two new positions on either side of the stage were created to uplight the proscenium arch with PAR64 fixtures. Accent lights to spotlight the masks of comedy and tragedy on either side of the stage, as well as the proscenium arch's frieze and cartouches, were added to the expanded front-of-house lighting position. The accent lighting comes from older theatrical fixtures that were in the opera's inventory. New slots in the ceiling accommodate theatrical followspots and house work lights. For lighting in the box seating areas, the original Tiffany glass covers for the pendants were cleaned and refitted.

The action onstage benefits from a completely revamped theatrical lighting system. New lighting consoles control more than 2,000 dimmer and power circuits linked by an Ethernet network. Eight new lighting bridges over the stage and the reworked front-of-house feature a complete array of theatrical luminaires. The new dimmer and transformer room was built at mid-level within the stage structure, economizing on wiring and providing acoustic isolation from the stage. The architectural and theatrical lighting controls are separate, although the theatrical control system can control any circuit in the house, since it's all networked.

The restoration of the War Memorial Opera House represents the completion of a special kind of circuit for lighting designer Larry French: he was a lighting assistant here in the late 1970s, near the very beginning of his career. ■

Sources

Original chandelier design: *Roberts Manufacturing Co.*
Chandelier restoration and installation: *Scott Architectural Lighting/ Taylor Stokes*
Uplights in chandelier: *Insight Lighting fixtures with GE lamps*
All other lamps: *Philips*
Original sconces and pendants: *Boyd Lighting*
Architectural and theatrical lighting dimming systems: *Strand Lighting*

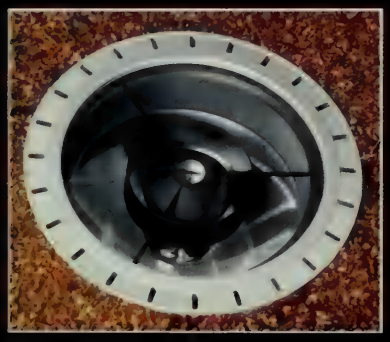


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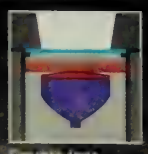
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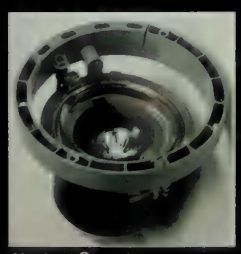


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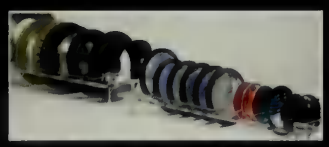


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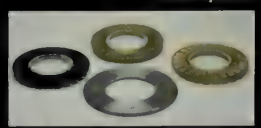
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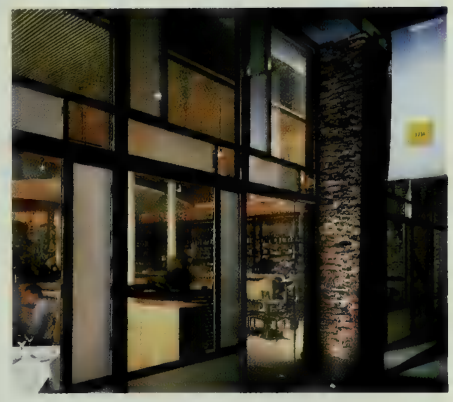
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CIRCLE 65 ON INQUIRY CARD

Diners Discover Einstein's Mass-Energy Relationship Redefined at mc²



by William Weathersby Jr.



Stainless-steel pendants shaped like inverted take-out coffee cups light tables in the main dining room at mc². Exterior columns are uplit by recessed MR16s.

With a name borrowed from Albert Einstein's formula for the relation of energy to mass—energy equals mass times the speed of light squared—the new San Francisco restaurant mc² creates its own dynamism by balancing refined materials with precise architectural lighting. Local architect Mark Cavagnero, AIA, who gained acclaim for his renovation of the city's California Palace of the Legion of Honor museum, designed a sleek Modernist interior within the shell of an 1870s Barbary Coast warehouse. Gutting a 7,000-square-foot ground-floor former law office to its structural walls, the architect has introduced linear forms and surfaces that stand up well against the robust brickwork envelope. With sycamore millwork, stainless-steel dowel dividers, limestone floors, leather banquettes, plaster walls, and a ceiling of hemlock slats, the interior emphasizes the integrity of unadorned surfaces and solid craftsmanship.

The element of illumination is as essential to mc² as it is to Einstein's equation. "Not only was the quality of light very important to the architect, but also the location and look of every light fixture," says principal lighting designer David Malman of San Francisco–based Architectural Lighting Design. "The restaurant's slatted wood ceiling, which masks the acoustical panels and air-conditioning ducts above, made this a challenging assignment. There was no ceiling surface available where we could employ conventional lighting." Collaborating with Cavagnero, Malman and his team translated the architect's aesthetic vision into a series of custom fixtures whose precise form and manufacture meld the energy of function and form.

A metal frame covered with scrim fabric undulates beneath an existing light well, creating a sculptural focal point in the center of the main dining room. During the day the scrim filters natural light while sparing diners a view of the second-floor office windows that open onto the light well. (A glass panel inserted under the light well at the restaurant's ceiling level captures ambient noise and cooking odors.)

At night the fabric panel becomes a floating wave of light, illuminated by six uplights. Each of these counterweighted pendants, custom fabricated in brushed stainless steel, hangs from a five-foot stem and houses a 300W quartz lamp. Along the edge of the fabric canopy, a series of MR16 fixtures recessed into a ceiling beam spotlights floral arrangements atop a serving credenza.

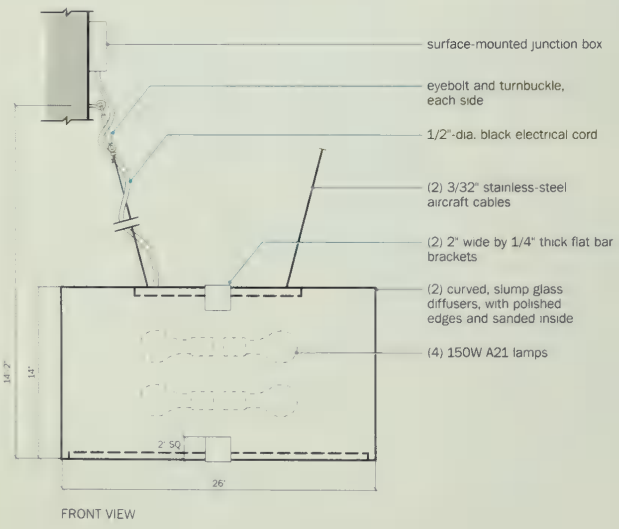
To create general ambient lighting, Malman again had to come up with an unconventional approach. "Typically in a restaurant you use the reflectivity of the ceiling to cast a flattering glow of indirect light up onto the faces of patrons," he says. "Here we were working with a slatted wood ceiling that would not be as reflective. Yet we didn't want to add more harsh-looking lights by putting pinspots over every table."

Project: *mc², San Francisco*
Owners: *Adi Dassler, Peter Puetzer*
Architect: *Mark Cavagnero Associates—Mark Cavagnero, AIA, principal; Roslyn Cole, Karen Gibb, associates; Jeffrey McGrew, Susanne Brincker, Joyce Jackson, Brad Davidson, Kerstin Anderson, design team*
Lighting designer: *Architectural Lighting Design—David Malman, principal; Juanita Cox and Nathan Naversen, design team*
Electrical engineer: *Hansen & Slaughter*
General contractor: *Fine Line Group*
Electrical subcontractor: *Scott Electric*

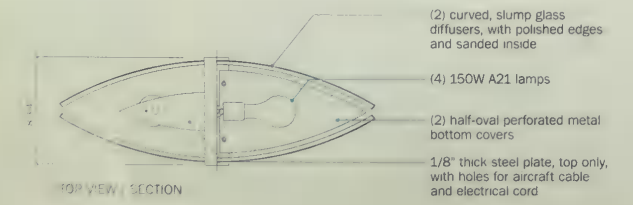




Stainless-steel pendants uplight a wave-shaped metal frame covered with scrim fabric. Twenty-watt reflector lamps behind a perforated metal valence downlight the back bar, and a row of R14s light the bar face.



FRONT VIEW



TOP VIEW | SECTION

Furthermore, the architect didn't want to interrupt the ceiling plane with junction boxes. The solution: a sea of 115 petite conical downlights housing 40W PAR16 lamps. Inspired by the shape of a carry-out coffee cup contemplated during a design team meeting, the stainless-steel fixtures are fitted with glass collars to cast a soft downlight while also emitting a bit of glow up toward the ceiling. Custom junction boxes less than an inch wide fit between the slats in the ceiling.

Along the perimeter of the 144-seat restaurant, Malman set lampholders 12 inches apart in a wiring channel and fitted them with 35W PAR14 lamps to wash the walls and rake the brickwork with light. At one end of the main room, bottles on the back bar are lit by a row of 20W 12V reflector lamps placed six inches on-center above a perforated metal valence. The 32-foot-long bar is spotlighted with PAR20 fixtures anchored to the steel frame that supports the fabric wave.

The intimate rear dining room accommodates 15 tables for two within a narrow space that was once an alley between buildings. The room's bare brick walls reach 25 feet up toward a pitched skylight. Light from the main dining room spills through arched openings in one wall as if onto a courtyard. In this space, Cavagnero and Malman wanted to evoke the look and feel of a street in an Italian hillside village, with lanterns suspended from diagonal wires overhead. They therefore developed a custom suspended luminaire fitted with four 100W A-lamps that are set behind curved panels of glass. A series of MR16 spotlights mounted near structural beams draws attention to paintings by artist Robert Kelly along one wall.

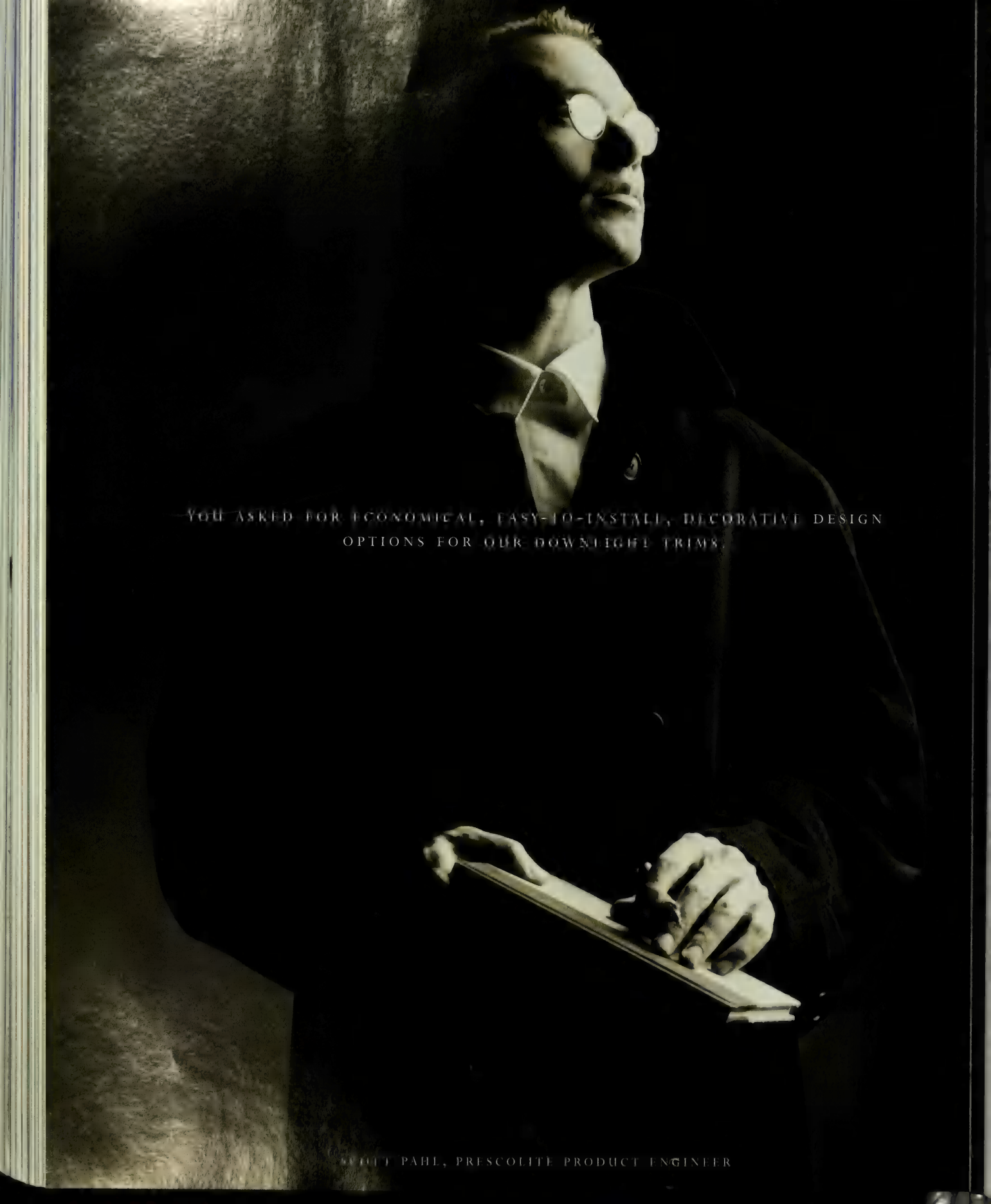
Throughout mc^2, Einstein's equation is altered in a contemporary way that he probably never imagined: the lighting is controlled by multiscene dimming. Here, total energy equals mass times the speed of light squared, minus the energy saved by the lighting controls. ■

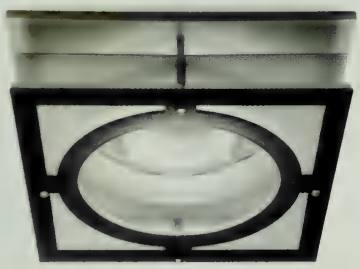
Sources

Custom fixtures: *Shaper Lighting*
Downlights: *Prescolite*
Socket strips: *Belfer*
Exterior uplights: *KIM Lighting*



Custom-made pendants hanging in what was once an alley are intended to evoke the feel of an Italian street lit by lanterns.


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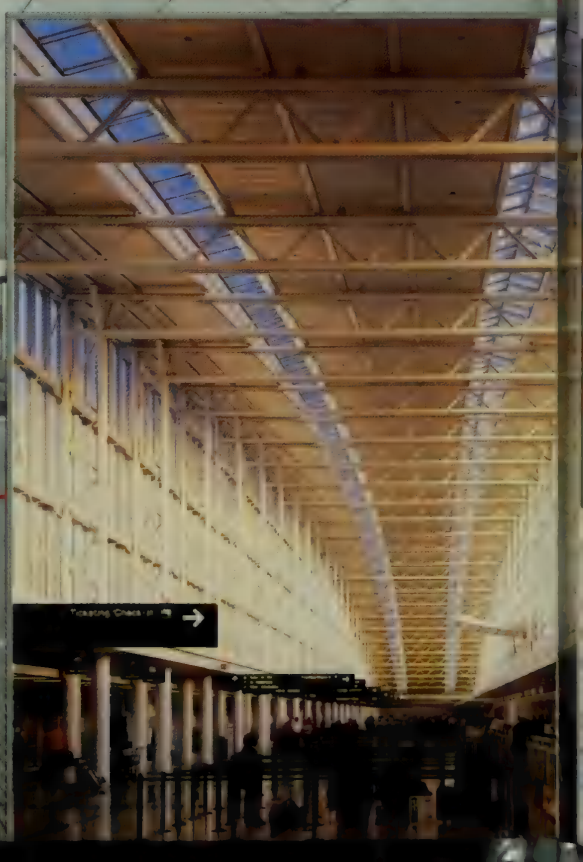
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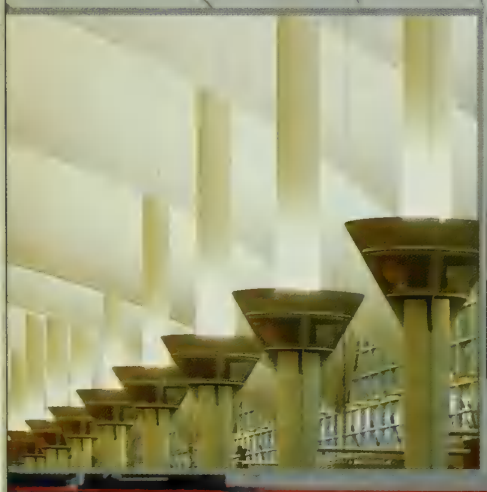
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CIRCLE 61 ON INQUIRY CARD

Screw-in Dimmable Compact-Fluorescent Lamps: Finally a Reality

by Lindsay Audin

Three new dimmable screw-in compact fluorescent lamps have just hit the market. Now, any existing room equipped with an incandescent dimming system can be retrofit with compact fluorescent lamps (CFLs) by merely screwing these new lamps in. The possibilities for the new lamps are endless: conference rooms, residential dining rooms, and large auditoriums are all typically equipped with dimmers.

Until the debut of these products, the dimming of compact fluorescent lamps often required expensive fixtures and special dimmers. None of the screw-in CFLs could be dimmed; in fact, trying to dim them created a fire hazard. Today, Philips Lighting, Technical Consumer Products (TCP), and Lumatech all offer various kinds of CFLs that can be used with standard UL-approved incandescent dimmers. The CFLs themselves are somewhat different, however, so designers should familiarize themselves with the products' characteristics before specifying them.

Why change lamps?

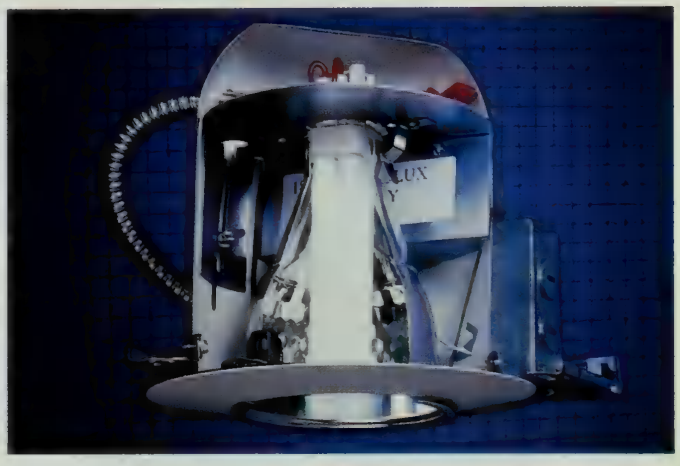
Dimmable CFLs consume less than one-third the wattage of comparable incandescent lamps and last three to 10 times longer. This makes them an economical way to cut both operating expense and maintenance costs. And the shift to CFLs need not be permanent: they can always be replaced with incandescent lamps if for some reason the need arises. When dimmed, energy savings are about 75 percent compared to incandescent lights dimmed to the same level, even down to about 10 percent of full brightness.



Early CFL dimming systems required special ballasts and dimmers, typically adding $50 to $80 to the cost of each recessed fixture on a project. Payback took too long for energy efficiency retrofits, making CFL dimming practical only when installed new. The new screw-in units cost only $8 to $20 more per socket and can be economical retrofits.

One-piece dimmable CFLs, regardless of the manufacturer, have built-in electronic ballasts with 10,000-hour lives. When they burn out, the entire unit is discarded. Two-piece units have separate lamp and ballast components, and the ballasts last 40,000 hours.

Lindsay Audin is president of Energywiz, Inc., an energy consulting firm, and lighting research consultant to E-Source, a Colorado-based energy consulting firm.



The Lumatech Reflect-A-Star Plus is an 18W triple-twin tube lamp in a high-efficiency metal reflector (above). The TCP SpringLamp fits into a table lamp (left).

The Philips Earth Light Dimmable CFL is a one-piece 23W triple-twin tube model, roughly comparable to a 90W A-lamp, although at 6.6 inches it is slightly longer.

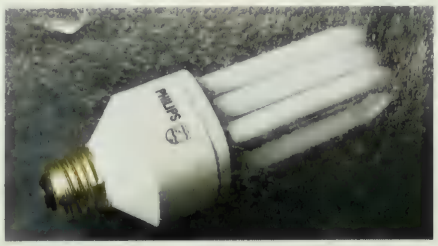
The TCP products are available in both one- and two-piece units and in a variety of wattages. The unit comparable to the Philips Earth Light is the one-piece 23W SpringLamp, which, with its tapering spiral-shaped tube, looks a bit like a soft ice cream cone. Smaller dimmable one-piece units are available in 11W, 15W, and 18W models. Glass reflector versions which have focused output are also available, as well as dimmable two-piece circle-style lamps in 22W, 30W, and 36W models.

The Lumatech Reflect-A-Star Plus is a two-piece model consisting of an 18W triple-twin tube lamp in a high-efficiency metal reflector, designed to fit into a six-inch or larger recessed can. Output is comparable to a 75W incandescent, while the lamp and ballast lifetimes are the same as the TCP two-piece units.

Dimming differences

The Philips and Lumatech products dim down to 10 percent of full output, while all TCP products can be dimmed to 20 percent. In either case, users should assess whether these minimums are acceptable before they purchase the lamp. In some situations, light levels need to be dimmed to 5 percent of full output, or even lower, to accommodate the visual needs of users. The pupil of the human eye opens widely when a space is darkened, and even 20 percent may appear to be quite bright once the eye adjusts.

The easiest way to determine whether a CFL will dim enough is



The Philips triple-twin tube dimmable CFL is a one-piece 23W lamp. At 6.6 inches in length, it is slightly longer than a standard A-lamp.

to simulate it with existing incandescent lamps and a footcandle meter. Check the light level at full output, and then dim the lamp down to 20 or 10 percent of that level. Let your eyes adapt for two minutes each time you dim and then decide whether the space is dark enough. If a projected image, such as a slide or video projection, will be used during a presentation, try one during the simulation to see if the contrast of the image is sufficient. If not, try the simulation again, this time testing for a lower-wattage CFL. At this point the room may be dark enough, but remember that the lamp still must be bright enough when it is operated at full light output.

Color shifting and decrease in output

Presently, all dimmable CFLs come in one color: 2700K with a color rendering index of 80 to 84. Users may also want to check for color shifting as CFLs are dimmed. All fluorescent lamps tend toward blue-purple when they are dimmed. People generally prefer a color shift toward red when light levels are lowered. A shift toward blue-purple may affect the ambience of a room.

When CFLs are inserted into fixtures that were formerly lamped with incandescents, the fixture's light output often drops, even when CFL lamp lumens may match incandescent lumens. In essence, a fixture designed for an incandescent source, which emits light from a concentrated point, may have a lower photometric efficiency when it is used with the more diffuse output of a CFL. This should be considered wherever peak fixture output is important, such as in a lecture hall.

While dimmable CFL manufacturers claim that their units will work on any UL-approved incandescent dimmer, a few tests are needed to verify compatibility. Check for *flicker* at the lowest level; *starting* at the lowest level; a *buzz* or *hum* from either lamps or dimmers; *dimmer heatup* at full and dimmed levels; and *how much time* it takes lamps to reach the desired output at either full or dimmed levels.

Note also that the power factor may be lower when the lamp is dimmed (.5 for the Philips lamp), and harmonic distortion is 24 percent higher for the dimmable CFLs. Also, note that there is no long-term track record yet for whether the dimmable CFLs will operate perfectly with every kind of dimmer. Should problems arise, the worst-case scenario may simply be that a cheap dimmer will have to be replaced with a better, more expensive one.

Product sources

Information for the products discussed above is available from the manufacturers at the following Web sites and phone numbers:

Philips: *http:/www.lighting.philips.com/nam/feature/earthlight/elight.shtml;* 800/555-0050

Technical Consumer Products: *http://www.springlamp.com/bulb_kits.html;* 800/324-1496

Lumatech: *http://www.lumatech.com;* 510/654-4300. ■

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CIRCLE 69 ON INQUIRY CARD

An Air Force Lighting Installation Shows How Sulfur Lamps Can Succeed

by David Simon Morton



A recent sulfur lamp retrofit at Building 225, a maintenance hangar at Hill Air Force Base, near Ogden, Utah, shows how sulfur technology, even with its high initial cost, can succeed in the marketplace. When sulfur lamps, or S-lamps, are coupled to light pipes—a natural fit, it turns out—the number of luminaires required for a given space can be drastically reduced. At Hill, this type of installation has proved more energy efficient and cheaper to operate than a metal-halide or mercury-vapor lamp installation that generates the same light levels.

There are qualitative advantages as well. Inside each sulfur lamp unit is a magnetron, such as those found in microwave ovens, that pelts with microwaves a spinning bulb filled with argon and sulfur gas. This bulb then emits a full spectrum of visible light, which is warmer than that produced by clear metal-halide lamps (5,700K versus approximately 4,000K), provides better color rendering (79 CRI versus 65 CRI), and won't degrade in output or experience color shifting over time. Because the lamps have no filaments or electrodes, they have a longer life span than metal-halide or mercury-vapor lamps, and since they contain no mercury, they can be disposed of easily. For the lighting of very large spaces, such as stadiums and factory floors, S-lamps show great promise.

In Building 225's low bay areas, where F-16 planes are maintained and repaired, only 88 1,425W Fusion LightDrive 1000 lamps were needed to replace an array of 448 400W metal-halide downlights, a system that, despite its size, did not provide adequate light. There are now 44 104-foot-long light pipes in the low bays, suspended 26 feet above the ground, with an S-lamp coupled to each end. As a result of the new installation, illumination at work surfaces in the low bays jumped to about 60 footcandles, an average increase of 50 percent over metal-halide downlights.



Light pipes work well with sulfur lamps because of the lamps' small bulb and high lumen output. Only two sulfur lamps are needed to illuminate each of these 104-foot-long pipes.

A single S-lamp unit in the low bay is not much more energy efficient than a single 400W metal-halide unit (95 lumens/watt versus an initial 90 lumens/watt for the metal halide), but it is much more powerful (135,000 lumens versus an initial 36,000 lumens). This makes S-lamps

Project: *Sulfur lamp installation, Building 225, Hill Air Force Base, Utah*
Lighting design: *CES/Way, Fusion Lighting, Cooper Lighting, 3M Lighting*
Installation and testing: *CES/Way*
Facilities managers: *Hill Air Force Base—Craig Priest, utility and energy manager; Kent Nomura, energy manager; Steve Hutton, contracting officer*
Lighting-quality verification: *U.S. Department of Energy Pacific Northwest National Laboratory—Carol C. Jones, senior research scientist; E. E. Richman; J. H. Heerwagen; J. B. Hollomon*

Sources
Sulfur lamps: *Fusion Lighting*
Downlight reflectors: *Cooper Lighting*
Light pipes and prismatic film: *3M Lighting*

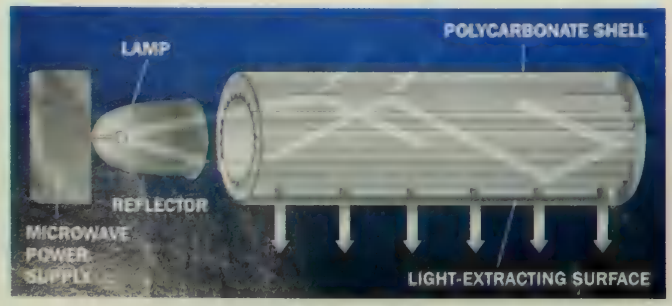


In the high bays, every metal-halide downlight was replaced by a sulfur lamp fixture, more than doubling the illuminance at work surfaces.

ideally suited for use with the 10-inch-diameter light pipes. The pipes work best with a small, high-lumen light source, like the golf-ball-sized S-lamp bulb, which, with a reflector, can produce a beam that is narrow enough and powerful enough to get a significant amount of output from the tube. The prismatic film of the pipes efficiently directs and evenly distributes this light. With a weaker lamp, the light system components would have to be repeated too often to be economical.

The light pipes give the workspaces much better horizontal lighting coverage, even under the wings of closely bunched F-16s, curtailing the need for task lighting. Shadows have virtually disappeared. Workers are better able to make out lettering on control panels and the colors of wiring, due not only to higher light levels, but also to the excellent color rendering.

The prismatic film that wraps the light pipes ensures even, high-efficiency distribution.



The energy savings from the low bay areas is more than enough to cover a net energy loss from the high bay installations, where both F-16 fighter planes and huge C-130 cargo planes are repaired. The Air Force did not allow the contractors to change the existing fixture placement in the high bays; the 42 1,000W metal-halide downlights in each bay were replaced by 42 S-lamps placed inside Cooper downlight reflectors, suspended at a height of 45 feet. Unfortunately there is no energy savings in these areas—new 1,000W metal halides produce 110 lumens/watt—only higher light levels. The new system provides more than 70 footcandles in most locations, and tops 100 footcandles in some places, a light that is uneven and in some areas excessive. The former metal-halide system provided approximately 30 footcandles at work surfaces here.

An installation like this isn't cheap enough to entice building operators who are hesitant to spend significantly more up front on what is still a new technology. Almost all current sulfur lamp installations are prototypes that use specially developed reflectors and light guides. But the creative partnership engineered by the energy services company (ESCo) that made possible the project at Hill may encourage a more rapid adoption of the technology. The ESCo installed the new system and will own and maintain it for the length of an 18-year contract with the base. It will reap most of the monetary savings from lowering the base's energy costs. The base, meanwhile, received the largest application of sulfur technology to date, at no cost to itself. ■

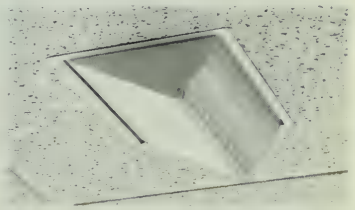


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LIGHTING BRIEFS



▲ Pendant fixture

The newly created company Davis/Muller Lighting has produced a collection of pendant fixtures called the 2150 series, which is available in numerous sizes, lamping options, and finishes. The fixtures have been designed to be used in combination with a complementary line of sconces and surface mounts. All of the fixtures are made of solid brass and are available with acrylic, natural alabaster, or cast-glass diffusers. 888/328-6855. Davis/Muller, Pawtucket, R.I.

CIRCLE 200

▼ On a bold track

Zumtobel Staff's Dancer track line includes an MR16 accent light, an MR16 framing projector (which accepts gobos for pattern projecting), and a T3 halogen wallwasher. The Dancer line, which made its debut at Lightfair as an accent light, is fully adjustable and rotatable. 800/448-4131. Zumtobel Staff, Highland, N.Y.

CIRCLE 201





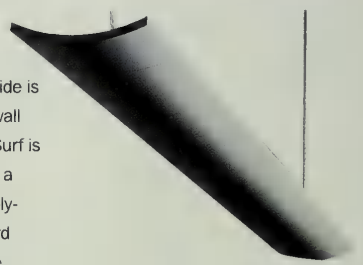
◄ Art in lighting

The Montreal-based company Artefice includes a group of designers, architects, and craftsmen who produce lighting for commercial and residential applications. The Volute lamp (left), designed by Robert Lepage as part of Artefice's Lueurs d'Orient collection of more than 100 lighting fixtures, is made of colored plastic and nickel-plated brass. Described by the designer as a piece of "integrated sculpture," the Volute lamp measures 11 by 17 inches. 514/527-6393. Artefice, Montreal.

CIRCLE 202

► Surf's up

Designed by Neil Poulton, the Surf modular lighting system from Artemide is available in either a suspension or wall version with T5 fluorescent tubing. Surf is made from extruded aluminum with a white or metallic gray embossed, polyester, powder-coated finish. Standard module sizes of 48 or 60 inches are available. 516/694-9292. Artemide, Farmingdale, N.Y. **CIRCLE 203**



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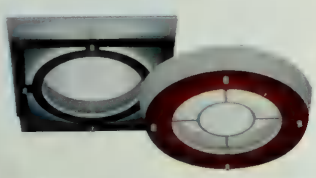
CIRCLE 73 ON INQUIRY CARD

LIGHTINGBRIEFS



▲ Exterior illumination
The exterior lighting for the new 46-story Banco Colpatria Tower in Bogota, Colombia, uses 36 Set Ireos 3,000W and 4,000W fixtures from Space Cannon Illumination to dramatic effect. For the opening of the building, Space Cannon president Bruno Bairdi and engineer Christian Perrotti had each fixture's dichroic lenses specially coated to create a colorful light show on the structure's facade. 888/705-1028. Space Cannon Illumination, Edmonton, Alta., Can. **CIRCLE 204**

▼ Circle in the square
Prescolite Moldcast's Signos SQ series has a square foundation and is available in metal, glass, or acrylic with lattice decorative trim. A glass cone, acrylic dome, or acrylic disk trims may also be specified. 510/562-3500. Prescolite Moldcast, San Leandro, Calif. **CIRCLE 205**





◄ Industrial high bay
Lumark Lighting, a Cooper Lighting brand, has introduced the Steeler SG, a prismatic borosilicate reflector with three light-distribution patterns (medium, wide, and narrow) and a 16- or 18-inch reflector. The UL-listed and CSA-certified Steeler SG is formed with a heavy-duty steel housing and has a dark bronze polyester powder-coated finish. The ballast has cla H insulation. 847/956-8400. Coo Lighting, Elk Grove Village, Ill. **CIRCLE 206**



◄ Rock 'n' roll picture show
The backdrop and scrim for the band Chicago's recent tour were designed by UV/FX to look different under various lighting conditions. Lighting designer Ian Peacock used Studio Color fixtures and Cyber Lights, from High End, to create the patterned look. 310/392-6817. UV/FX, Santa Monica, Calif. **CIRCLE 207** 512/836-2242. High End, Austin, Tex. **CIRCLE 208**

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LIGHTING BRIEFS

▼ Expanded sconce collection
Flos's collection of sconces by Marcello Ziliani now includes Spike and Marci (below). The new sconces fit on the same base as the four earlier designs. Marci has a parabola-shaped glass diffuser on an aluminum base. Available in silver, gold, gray, and black. 516/549-2745. Flos, Huntington Station, N.Y. **CIRCLE 209**



► Traditional table lamps
Inspired by the fragile paper lanterns used in harvest festivals during his childhood, designer Toshimitsu Sasaki utilized a traditional Japanese paper called washi to create the WAB table lamp for Yamagiwa. Made from mulberry bark and then laminated for strength and durability, washi is resistant to yellowing and crumbling. 818/879-8611. Yamagiwa Corporation, Westlake Village, Calif. **CIRCLE 210**





▼ Material-efficient fixtures
Frankie Goes Fluorescent, a dimmable compact series of lights made from recycled glass and Environ (a bicomposite of recycled and sustainable materials), is available as a ceiling fixture (below), a wall sconce, and a table lamp. 212/475-3106. Fire & Water Lighting/David Bergman Architects, New York City. **CIRCLE 211**



▲ Grand Teton
B-K's Teton fixture can be used for indirect uplighting or direct downlighting. Made of machined aluminum, the light's body can be finished in any one of eight polyester powder-coated finishes or three brass finishes. The fixture is completely sealed and wet-location-listed for indoors and outdoors. 209/438-5800. B-K Lighting, Fresno, Calif. **CIRCLE 212**

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CIRCLE 136 ON INQUIRY CARD

LIGHTING BRIEFS

► Triangular wall sconce

Advent Lighting's new triangular exterior wall sconce (AE7050) measures 30 inches high and 13¾ inches wide. The fixture is made of .063-inch-thick aluminum noncorrosive housing and ⅛-inch-thick opal polycarbonate lenses, with top and bottom lenses made of tempered glass. The housing is also available in custom colors, textured paint, brushed aluminum, antiqued brass, chrome, and textured metals, and the lenses can be constructed of faux alabaster. 800/739-9144. Advent Lighting, Greenville, Wis. **CIRCLE 213**





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◄ Lite lines

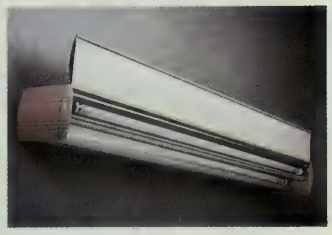
The Tivoli Lite-Bar, an incandescent system for interior or exterior canopies, facades, and building perimeters, consists of straight or curved two-piece channels that snap together. Made of extruded aluminum, the system can be specified in lengths of up to 12 feet per section. 800/854-3288. Tivoli, Santa Ana, Calif. **CIRCLE 215**

▼ Simply Swedish

Luxo's Designer series includes 24 models of wall sconces and ceiling pendants, all inspired by Swedish architectural designs reminiscent of the Machine Age. The lights, which have plated or painted metal bodies with a clear or opal acrylic light diffuser, distribute light from a range of low-wattage incandescent or compact fluorescents. 914/937-4433. Luxo, Port Chester, N.Y. **CIRCLE 214**







▲ An open-and-shut case

Vista's Lumiform 7200 series, intended for use over patient beds in hospital rooms, is available in Colonial or contemporary Convex styles in two-, three-, and four-foot lengths. A hinged door panel locks in an open position for easy maintenance. The light utilizes a T8 or T5 fluorescent lamp or Biax compact fluorescent. 800/576-2135. Vista, Girard, Pa. **CIRCLE 216**

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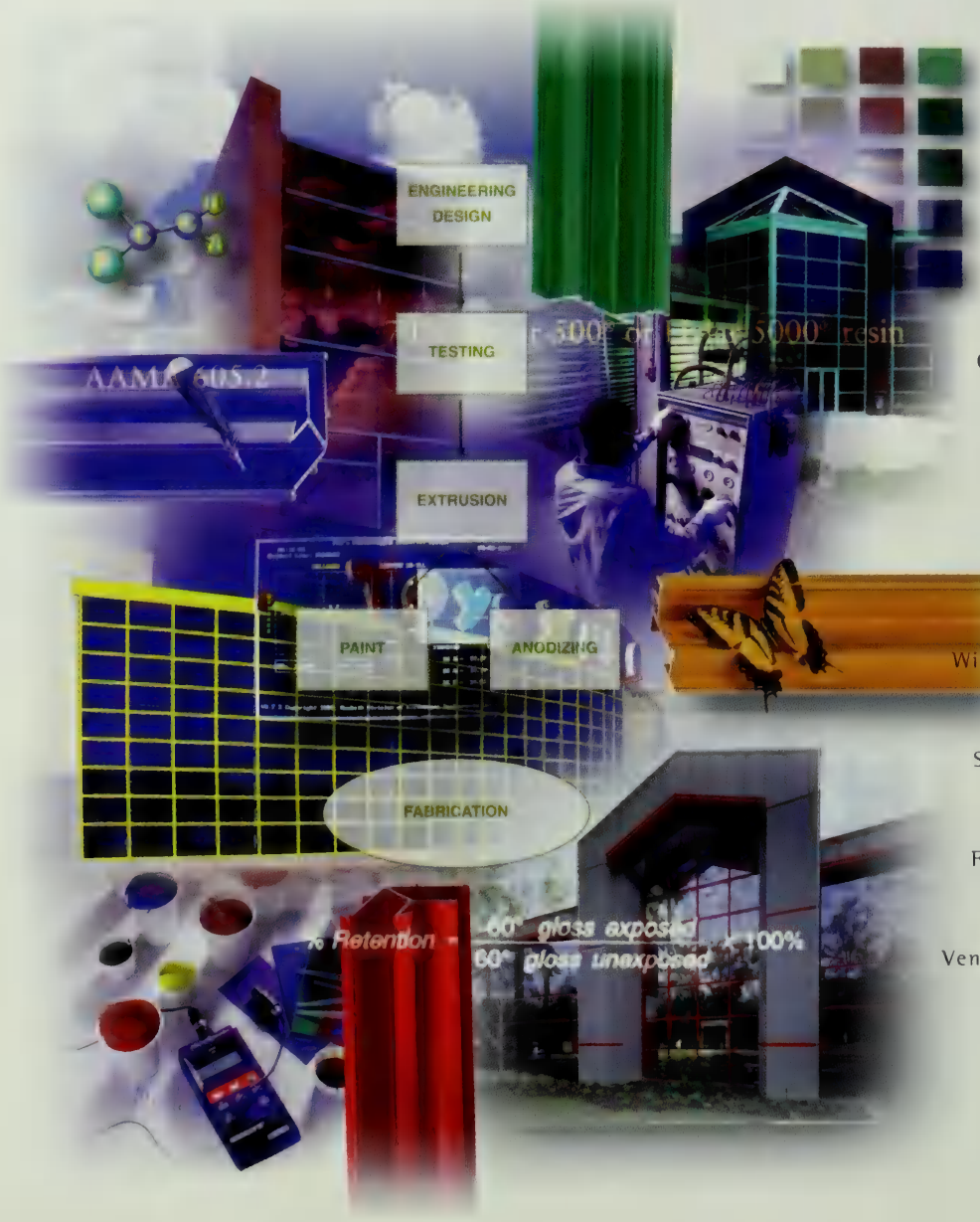
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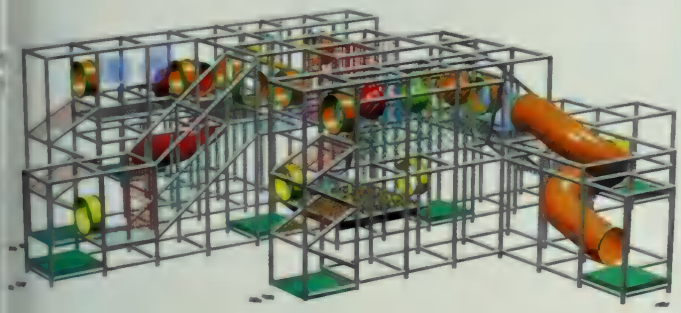
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NEW PRODUCTS

WITH PLAY STRUCTURES, FUN FOLLOWS SAFETY AND A CHILD'S DEVELOPMENT



This month, editor David Simon Morton takes a look at various playground packages and recreational surfaces that are available in the marketplace, from faux ice and grass to intricate playground structures. Manufacturers of recreational equipment have always been concerned with fun and safety. Today, these same designers want to promote children's educational and developmental needs as well as aesthetics. These new selling points are good news for architects, who can now promote a more well-rounded playing field.

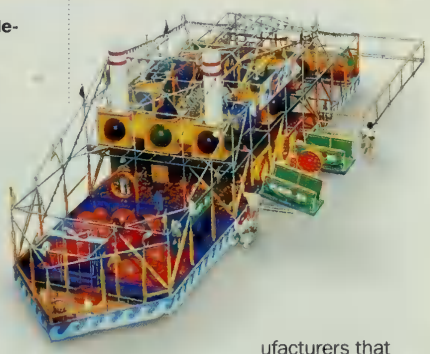
—Elana H. Frankel, Products Editor

Two years ago, when the New York–based firm Garrison Siegel built Recycled Ground, a playground for a school in the South Bronx, principal Robert Siegel specified components of play systems from various manufacturers rather than one company's total kit. He ordered a slide and a balance from a catalog, for example, but had most of the rest of the structure custom made. Why? "[Most systems had] little architectural intention," says Siegel. "They didn't make a form that meant anything, even though they were intelligently designed from an educational point of view."

Playground equipment manufacturers have begun to take Siegel's point, which is shared by many other architects, into consideration when creating new designs. Today, recreation kits are aesthetically pleasing *and* educational. One company in particular, PentesPlay, is concerned with both aspects of the play experience. For example, the three systems shown here are educational—they encourage children to play within the intricate system, stimulating the imagination much more than if they were simply playing on top of it—and attractive.

Another industry insider, Eric Strickland of Grounds For Play, emphasizes fun and education, but he also wants to help fulfill children's developmental needs. Strickland's credentials are impressive: he earned a doctorate in early childhood education, taught in the Head Start program, and consulted for churches and schools that wanted to build playgrounds. He then started Grounds For Play, which designs, manufactures, and installs play structures—a trio of services offered by other industry players.

Strickland says that, although he can sell a client one component or another, he feels his customers are best served when he can do a complete evaluation of the children's needs and then design a playground to meet them.



A play structure with themed elements assembled from several PentesPlay packages (right).

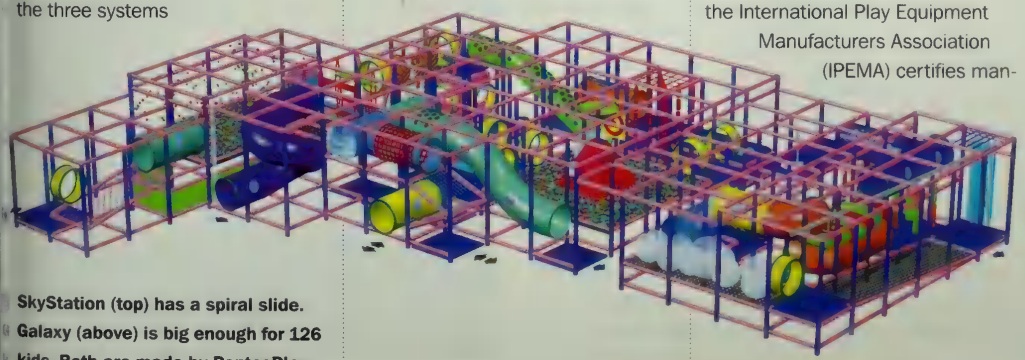
For children ages two to five, Strickland suggests elements that promote "socio-dramatic play," that is, activity that encourages children to play imagined roles. He suggests such play pieces as domed skylights, steering wheels, porthole windows, and rocket nose cones that allow kids to imagine they are piloting a spaceship or a submarine.

Older kids like chase games with tricky paths and obstacles, such as ball pits and climbing nets. It's important, says Strickland, to keep younger kids safely out of the way of the older kids scrambling over the equipment. He also makes room for shared space, so children of disparate ages can play together.

Safety is obviously paramount, and manufacturers take great pains to establish their reputations in this regard. Siegel believes that the industry's wide acceptance of liability is one reason for its continued success. For further emphasis, the International Play Equipment Manufacturers Association (IPEMA) certifies manufacturers that conform to safety guidelines covering playground equipment.

However, standards don't always ensure that a given installation is safe. According to consultant Butch DeFillippo of New Mexico–based PlaySafe, small companies are not as likely to be aware of all the safety issues as larger ones.

DeFillippo also notes that 70 percent of playground accidents are due to falls, raising the question of what surfaces are appropriate for use with play equipment. Asphalt, the old playground standard, has given way to artificial wood fibers, sand, pea gravel, and rubber tiling, some of which meet ADA requirements. Several of these new products are profiled on the next page. *David Simon Morton*



SkyStation (top) has a spiral slide. Galaxy (above) is big enough for 126 kids. Both are made by PentesPlay.

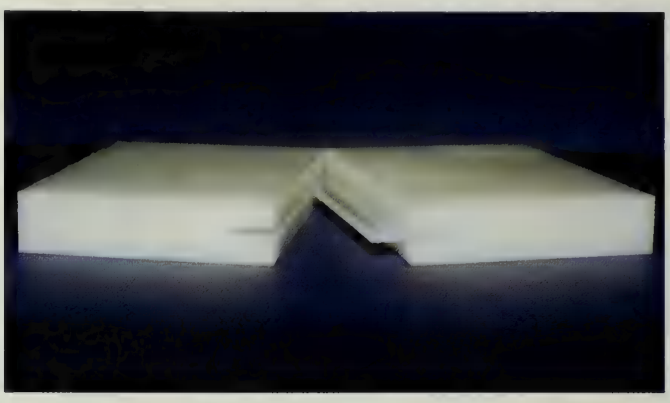
BCI Burke, Fond du Lac, Wis.
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GameTime, Fort Payne, Ala.
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Grounds For Play, Arlington, Tex.
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Miracle, Monett, Mo.
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PentesPlay, Charlotte, N.C.
800/617-2158 CIRCLE 222

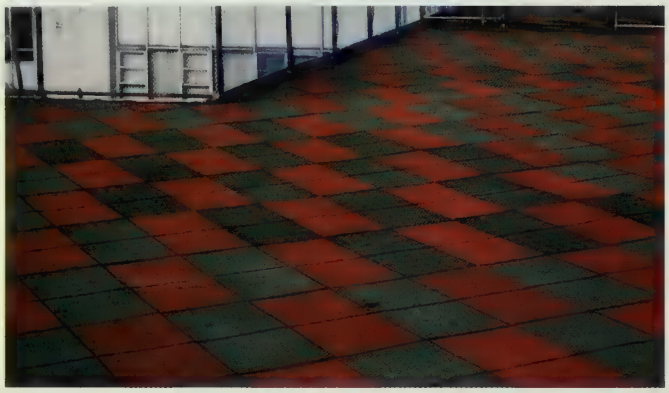
SURFACES MAKE PLAY CHEAPER AND SAFER

When kids in Florida want to play outdoor ice hockey and children in desert states want to play soccer, artificial surfaces that perfectly mimic the qualities of their real counterparts are often the best (and usually the cheapest) choices. As for playground surfaces all over the country, it was determined long ago that children rebound much better from rubber than asphalt. *D.S.M.*

► Ice hockey under the sun

Super*Ice* has all the playing qualities of the cold stuff, but this synthetic surface of double-sided polyolefin panels doesn't need freezing temperatures or a Zamboni to keep it in good condition. Skaters can still do hockey-stops and, just as with the real thing, kick up shavings. When the surface has worn down, the panels can be flipped over and the reverse side used. 323/939-8200. American Ice Enterprises, Los Angeles. **CIRCLE 223**





▲ Up on the roof

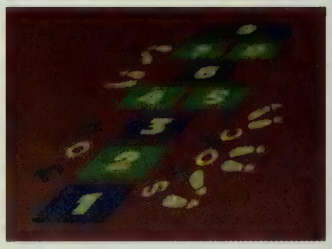
City dwellers can put a playground on the roof without having to worry about asphalt's summer stickiness. Playbound rooftop tiles feature composite construction. For durability, the top layer has a high polyurethane content. The bottom layer has less polyurethane for shock absorbency. Each tile is on small stilts to allow grit to flow under. 800/999-0555. Surface America, Williamsville, N.Y. **CIRCLE 224**

▼ Tile style

Health clubs can now install designer rubber tile flooring. Because Pawling's Dec-O-Loks 24-inch-square hard rubber tiles are interlocking, no glue is necessary to keep them in place. They feature flecked mosaic-style patterns that are usually found only on glue-down systems. 800/431-3456. Pawling, Wassaic, N.Y. **CIRCLE 225**







▲ Bounce back

The shredded remains of recycled rubber tires make up SofCrete, a pour-in-place resilient surface that can be molded into three dimensions. 800/263-2363. SofSurfaces, Sarnia, Ont. **CIRCLE 226**



▲ Built to stay...and move

What you see is a maple strip basketball court, but underneath it is Bio-Channel, a system of cushions and anchors. The system ensures that the playing surface meets the main standard necessary for play: It doesn't move, but it should give a little. Steel channels anchored to the concrete subfloor keep the court in place; sleepers suspended over cushions in the channels allow the court vertical movement. 800/543-1913. Robbins Sports Surfaces, Cincinnati. **CIRCLE 227**

► Keep the ball rolling

Designed for both indoor and outdoor soccer, AstroPlay feels like grass to running feet and bouncing balls. Rubber crumbs and a sand mix are layered among green fibers of polyolefin to achieve grasslike realism. Nylon fibers below the layers of rubber and sand, an area called the Thatch Zone, give the turf better drainage. A bottom layer of rubber granules provides more resilience. 800/580-8873. AstroPlay Sports Surfaces, Leander, Tex. **CIRCLE 228**





Gremlins Zero. Polly Won.

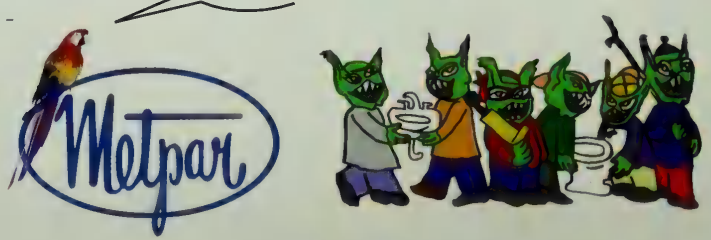
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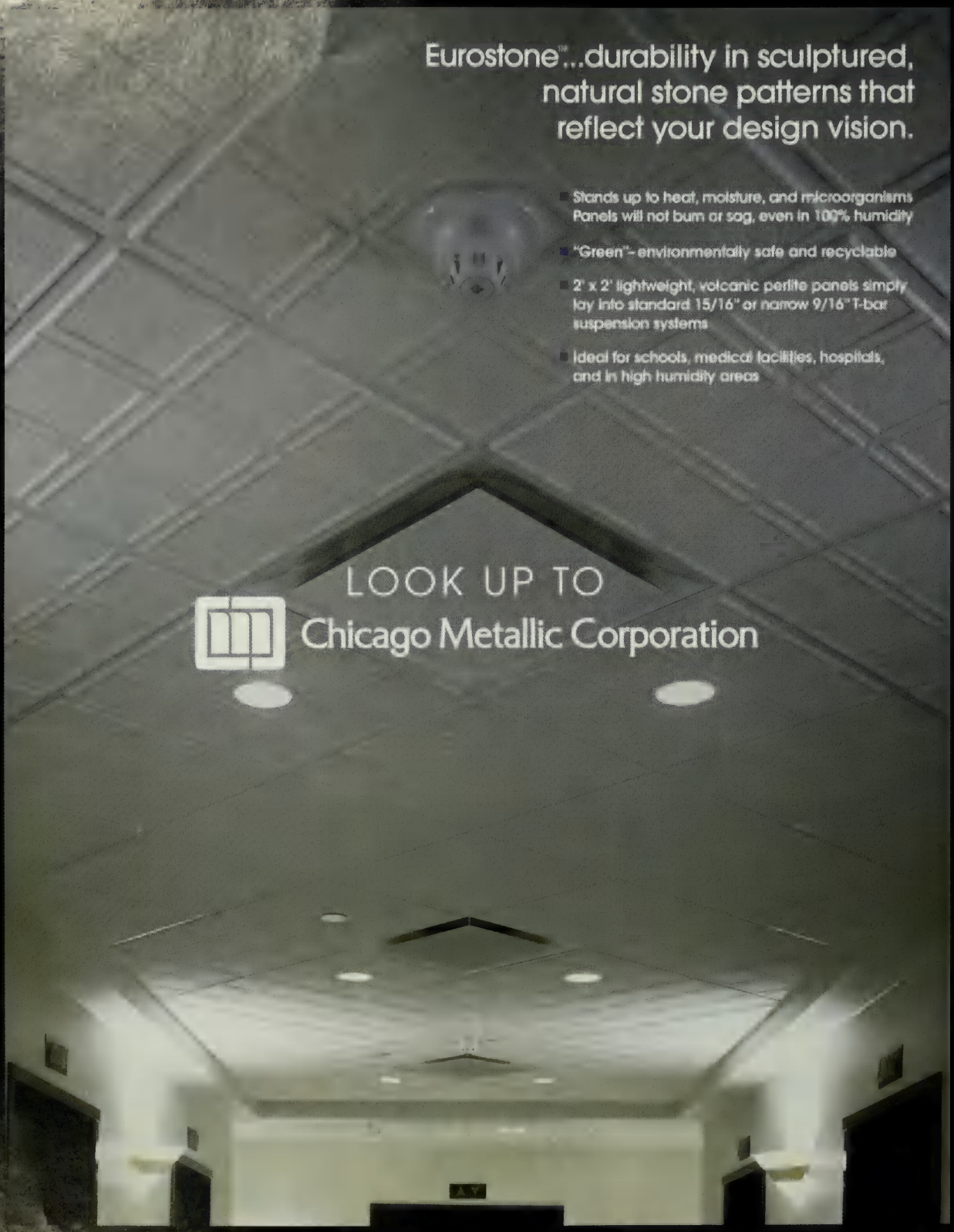


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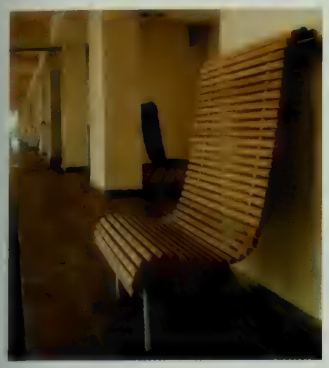
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PRODUCT BRIEFS



▲ Teak seat
Andrée Putman's exclusive collection for the new Manhattan showroom Furniture Company includes a chair, three benches (one of which is shown here), and two side tables, all in teak. Other designers represented in the showroom include founder David Schaeffer, Bill Katz, and Alison Berger. 212/691-0700. Furniture Company, New York City. **CIRCLE 229**

▼ Stackable shape
Created in Denmark by Komplot Design, Krug's stackable beechwood and steel Can Can chair is available with a wood seat and back (and 10 finish options) or an upholstered seat. Matching tables are also available. 888/578-KRUG. Krug, Kitchener, Ont. **CIRCLE 230**



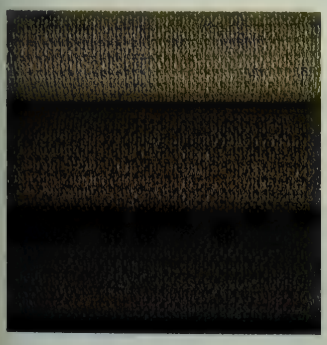


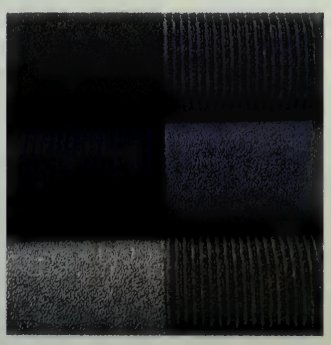
▲ Glass mosaic tiles
The collaborative relationship between Italian architect Alessandro Mendini and Bisazza was established when Mendini used the company's glass mosaic tiles to create a signature spiral staircase for the Gröningen Museum in Holland (above). So it was no surprise when Bisazza once again called on Mendini to apply his unique style to its New York City space, the first company-owned showroom in the United States. Based on the original Casa Bisazza, the company's flagship space in Milan, the Manhattan showroom opens this fall. 305/597-4099. Bisazza, Miami. **CIRCLE 231**

▼ Form, function, tea, or coffee?
Krups recently introduced the Frank Lloyd Wright Guggenheim Collection of porcelain coffee and tea accessories, including 2.5-ounce espresso and cappuccino cups and matching saucers, 10-ounce coffee and tea mugs, and a 38-ounce teapot. As distinctive as the museum itself, the entire collection is available in white and is dishwasher and microwave safe. 800/526-5377. Krups, Closter, N.J. **CIRCLE 232**



▼ Luster underfoot
Shaw's MetAllure collection includes Simone (left), which has a subtle metallic accent. Its GlassMaker collection (right) includes Theo, a striped pattern, and Marcel, which plays on geometric tones and textures to evoke stained glass. All are suitable for heavy-duty commercial use. 706/278-3812. Shaw, Dalton, Ga. **CIRCLE 234**







▲ New tile style
Tulikivi's nontoxic, nonabsorbent, soapstone tile is quarried in Finland and can be used for floor and wall applications. The dove gray soapstone with white veining is offered in a smooth or rough-cut finish. Tiles are 11 3/16-inch square with a thickness of either ½ inch or ⅝ inch. 804/977-5500. Tulikivi, Charlottesville, Va. **CIRCLE 235**

▼ Woven trades
Conrad has introduced two new hand-woven window coverings to its Original Sunshade collection of more than 30 coverings made of natural grasses, reeds, and fibers. Shown below are Grasslands (weave #248), made of natural hemp (top); and Stephen E. Earls (weave #1460), made from a weave of arrowroot fibers to resemble creamy white-colored raw silk (bottom). 415/626-3303. Conrad, San Francisco. **CIRCLE 233**



► Skylight improvements

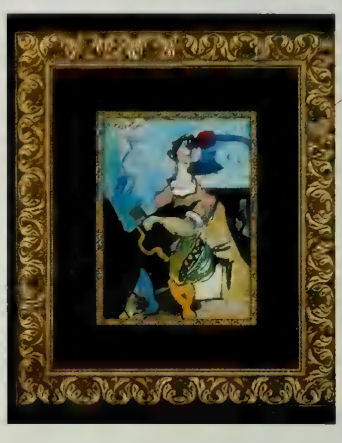
The Philadelphia Airport's B/C terminal improvement project included CPI's Pentawall polycarbonate glazed panels in the expanded US Airways ticketing area (hipped-ridge skylights and a warped-plane lean-to skylight); a connector concourse with moving sidewalks between previously separated terminals (two sloped-roof skylights); and new mall and baggage-claim areas. 847/816-1060. CPI, Lake Forest, Ill. **CIRCLE 236**





► Framed remembrances

The two new series of frames from Larson-Juhl's Craig Ponzio Signature collection are Vermeer and El Greco (right). Inspired by the Dutch master, Vermeer is a series of simple, sleek gold- and silver-finished frames. El Greco is a more bold and expressionistic collection, inspired by the passionate style of the Spanish artist. Black embossed patterns in burnished gold are handcrafted by Spanish artisans using the traditional gilding method. 770/279-5200. Larson-Juhl, Norcross, Ga. **CIRCLE 237**





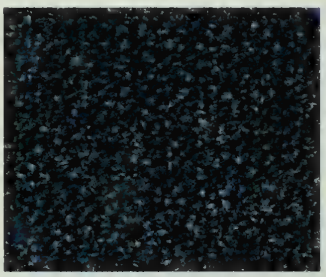
◄ Save water...

Compared to conventional toilets, which can use as many as seven gallons of water per flush, the power-assisted Ultra-Flush from Gerber uses only 1.6 gallons per flush. The toilet's water seal and trapway systems exceed the three- and two-inch minimums respectively. One-piece standard models are available, as are two-piece models with either elongated or round-front profiles. 847/675-6570. Gerber, Chicago. **CIRCLE 238**

▼ Digital TV, a European import

The German electronics company Loewe recently partnered with Arizona-based Sensory Science (formerly Go-Video) to market 11 varieties of digital color televisions in the United States. Shown here is the 32-inch Calida model, which is available with either an arctic silver or matte black finish. Loewe televisions, which have HDTV-compatible connections to accommodate future technologies, can be connected to most PCs. 877-LOEWETV. Sensory Science, Scottsdale, Ariz. **CIRCLE 239**



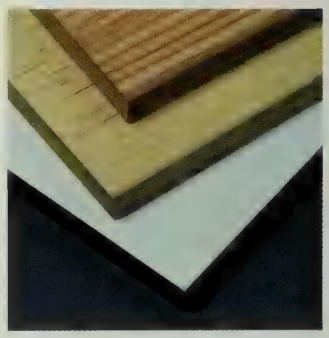


▲ Static-free environments

The Manhattan-based flooring company Associated/ACC now carries the full line of electrostatic discharge (ESD) control flooring from VPI in its showroom. 212/633-0250. Associated/ACC, New York City. **CIRCLE 240**

► Wheat jambs

Windsor Window has introduced pine-veneer, oak-veneer, and white vinyl extension jambs made of WheatBoard, an engineered composite board made from wheat plants. The wheat stalks are milled into fine particles and then compressed. The extension jambs are available with the Next Dimension line of vinyl windows. 515/223-6660. Windsor Window, West Des Moines. **CIRCLE 241**



► LaserJet printer for CAD

Hewlett-Packard's new laser jet 8500 printer uses AutoCAD drivers (supporting AutoCAD releases 10–14 for DOS, Microsoft Windows 3.1, 95, and NT) to produce B-size color plots. The driver bypasses Windows to interface directly with AutoCAD's ADI format. The printer can create CAD files and overlay them on imported photographs. The system also doubles as an office printer for color presentations on a variety of paper sizes. 800/LASERJET. Hewlett-Packard, Palo Alto, Calif. **CIRCLE 242**



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► Seating style

Lobby, designed by Hansulrich Benz for the Walter Knoll Furniture Company (Walter K.) and distributed by M2L, is available as a chair, a two-seater, a 2½-seater, and a three-seater sofa (shown). The steel frame is available in matte chrome; armrests in natural wood are also available. Upholstery options include ultra-suede, leather, and fabric. Matching square or rectangular tables in clear or satinized glass are also offered. 800/319-8222. M2L, New York City. **CIRCLE 243**



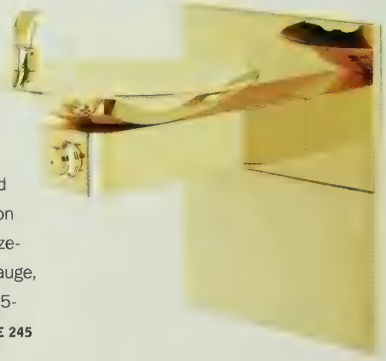
▼ Seasonal accents

The new Bob Timberlake collection from Epro includes four series of tiles: spring, summer, winter, and fall. Each line features reliefs, decos, and liner tiles. Available in a variety of colors, the tiles can be used as accents on floors, walls, countertops, or other applications. 800/550-6694. Epro, Westerville, Ohio. **CIRCLE 244**



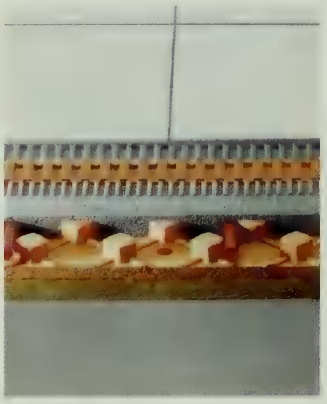
► Fountain series

Haws's ADA-compliant 1000MS drinking fountain (right) is made of stainless steel with a gold finish and matching bracket, bubbler, waste strainer, and push-button valve. The 1001 model has a satin-finish bowl and bracket and chrome-plated bubbler, push-button valve, and waste strainer. The freeze-resistant 1001FR is made of 18-gauge, satin-finish stainless steel. 510/525-5801. Haws, Berkeley, Calif. **CIRCLE 245**



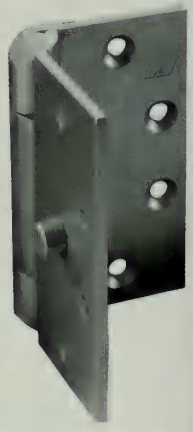
▼ Energy-efficient flooring

Schluter's Bekotec floor-covering system includes a heat and sound insulation layer, which is installed over a load-bearing substrate (typically, reinforced concrete); insulating strips, which are placed on the perimeters; a PE-foil insulation cover; and a polystyrene panel, which is installed over the entire area. The system is then covered with a mortar or poured-anhydride (gypsum-based) screed. 800/472-4588. Schluter Systems, Plattsburgh, N.Y. **CIRCLE 247**



▼ High-security hinge

McKinney Products, a subsidiary of Assa Abloy/Essex, manufactures a cast institutional hinge with nonremovable, concealed, stainless-steel pins to prevent tampering. Three hinges can hold a door as big as three by seven feet and weighing up to 300 pounds. 203/624-5225. McKinney Products, New Haven, Conn. **CIRCLE 248**



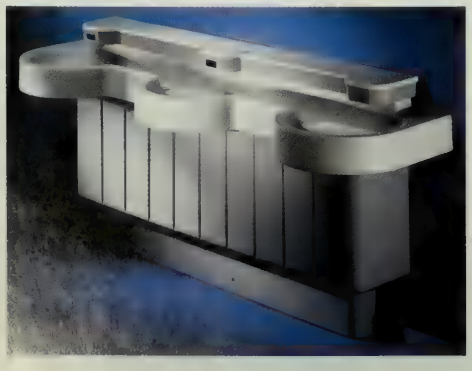


◄ Toilet revival

A new fill valve for tanked toilets is part of the Smart Valve 2000 and Smartparts repair parts kit from American Standard. Also included is an aquameter water-control feature with an antisiphon design. 800/524-9797. American Standard, Piscataway, N.J. **CIRCLE 246**

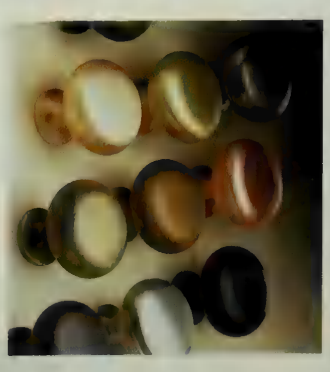
► Lavatory line

The Bradley Express lavatory system, first introduced in 1992, is now available in one-, two-, or three-person handwashing stations in a single fixture. Junior-height models are also available. The washbowls and shelves are made from a durable solid-surface material. The system meets accessibility requirements and is ADA [illegible] and [illegible] with adequate wheelchair clearance. 414/251-6000. Bradley, Menomonee Falls, Wis. **CIRCLE 249**



► Matte finishes

Eleven new matte finishes have been added to the surfaces of Colonial Bronze's entire line of solid brass cabinet hardware. New finishes include matte satin brass, antique brass, satin bronze, oil-rubbed bronze, antique copper, satin nickel, pewter, black, statuary bronze, dark statuary bronze, and satin copper. All have a lifetime guarantee against tarnishing. 860/489-9233. Colonial Bronze, Torrington, Conn. **CIRCLE 250**





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PRODUCTLITERATURE

Door parts

L. E. Johnson's new catalog includes information on sliding, folding, and pocket door hardware. 800/837-5664. L. E. Johnson, Elkhart, Ind. **CIRCLE 251**

Service hardware

New products in the Custom Service Hardware catalog include T moldings and halogen lights. 800/882-0009. Custom Service Hardware, Cedarburg, Wis. **CIRCLE 252**

Steel shingles

MetalWorks has new steel shingle sample kits for the AstonWood and Stone Crest lines. 800/320-0101. MetalWorks, Moon Township, Pa. **CIRCLE 253**

Garage doors

Amarr recently introduced its new residential garage door sales literature. 800/503-DOOR. Amarr, Winston-Salem, N.C. **CIRCLE 254**

Chemical product database

The Euclid Chemical Company database on disk includes information on concrete products. 800/321-7628. Euclid Chemical, Cleveland. **CIRCLE 255**

Undercabinet lighting

Starfire's Tru-Lux brochure shows cove lighting and wall luminaires. 800/443-8823. Starfire, Jersey City, N.J. **CIRCLE 256**

Exit devices

DORMA's new brochure details the 6000 series of fire and panic exit devices. 800/523-8483. DORMA, Reamstown, Pa. **CIRCLE 257**

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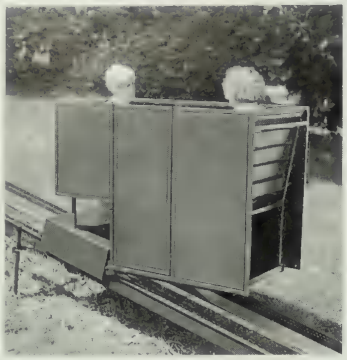
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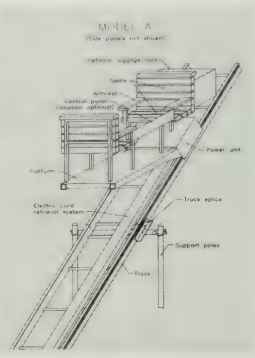
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PRODUCTLITERATURE

Digital details

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Autumn teak

Smith & Hawken's fall trade catalog includes the eight-foot teak Governy bench, shown on the cover. 415/389-8300. Smith & Hawken, Mill Valley, Calif. **CIRCLE 259**

Resilient flooring

Domco's Azrock brand of commercial flooring has introduced its new catalog for resilient commercial flooring, including information on vinyl tiles, Roman Stone, and Madras Slate, as well as PVC flooring for cleanrooms and laboratories. 800/921-1717. Domco, Florence, Ala. **CIRCLE 260**

Simple lights

The Arroyo Craftsman company manufactures ceiling pendants, wall sconces, floor lamps, and outdoor fixtures, all inspired by the Arts and Crafts movement. 626/960-9411. Arroyo Craftsman, Baldwin Park, Calif. **CIRCLE 261**

Grout colors

Laticrete manufactures ceramic tile and stone installation systems. The cover of its new architectural binder features the 27 grout colors in the Renaissance palette. 800/359-3297. Laticrete, Bethany, Conn. **CIRCLE 262**

Linear lighting

RSA Lighting's new brochure highlights recessed, retail/display, track, architectural linear, theatrical/stage, and decorative linear lighting. 818/349-3030. RSA Lighting, Chatsworth, Calif. **CIRCLE 263**

Natural fibers

The latest carpet collections from Ruckstuhl are :PUR, manufactured from coconut, sisal, cotton, wool, jute, flax, linen, horsehair, goat hair, and paper; and BORDO, a new series of borders. 908/686-7203. Ruckstuhl, Union, N.J. **CIRCLE 264**



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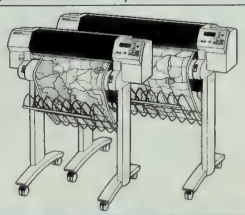
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Instructions

- Read the article "Restoring a Nebraska Landmark" (page 133) using the learning objectives provided.
- Complete the questions below, then check your answers (page 194).
- Fill out and submit the self-report form (page 194) or file the form on ARCHITECTURAL RECORD's Web site (www.archrecord.com) to receive two AIA Learning Units.

Questions

1. Why is the Nebraska State Capitol a significant example of American civic architecture?

2. Why were the early efforts to restore the capitol ineffective?

3. How was the site survey and condition report made?

4. How was the interplay between construction materials responsible for the damage to the exterior facade?

5. Why was the computerized database developed?

6. Which computer programs were used, and for what purpose?

7. What recommendations were made to remedy the problems?

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ANSWERS

Questions appear on page 192. To receive CES credits, fill in the self-report form below or on our Web site (www.archrecord.com).

1. The Nebraska State Capitol was built at a time when civic architecture was principally neoclassical. The capitol was distinctly American in form and ornamentation and set an example for civic structures throughout the nation. It also incorporated a skyscraper, an evolving American form.

2. Early restoration attempts addressed the symptoms rather than the causes of stone distress. In the 1960s and 1970s the cracking, spalling, delamination, efflorescence, stone displacement, cracked mortar, and algae growth were treated with destructive means, including sandblasting, pressurized water spray, and epoxy. However, cracks continued to form.

3. The condition report documented the site in written and graphic form, prioritized the restoration work, developed construction cost estimates, and provided information to create a computerized database to record the distress on the facade. The analysis of the facade began with a review of the archives. Inspections were conducted from scaffolding or by rappelling from the top of the dome. Samples of building materials were examined in the laboratory.

4. The interplay between the masonry and the steel was acknowledged as a possible problem by the original designers. Even though the stone is highly durable, the way it is attached to the brick and steel beneath is problematic. The horizontal pressure-relieving joints at each floor were designed to allow masonry and steel to behave independently, but the joints penetrated the stone, not the brick. Also, the mortar is so strong that brick and stone acted as a single unit instead of independently. The ties between the masonry and the steel exacerbated the problem.

5. A computerized database was developed for convenience in accessing and organizing information. A relational database was set up between the stone distress data and the survey drawings of each stone, which helped the team to quickly comprehend the problems with the capitol.

6. There was a substantial amount of data to analyze, so several software programs were needed, necessitating a computer with ample memory and speed. Microstation 95 created the CAD drawings. Microsoft Access 7.0 was the main database software. Microsoft Visual FoxPro 3.0 was used to design the database tables, and Adobe Photoshop 3.0 made realistic images from the CAD data.

7. The outcome of the computer analysis was a report detailing problems with the capitol and suggestions for restoration, including modifying the relief joints and redesigning the brick back-up, repairing the stone on the facade, and selecting an appropriate cleaning technology.

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☐ "Restoring a Nebraska Landmark" (page 133)
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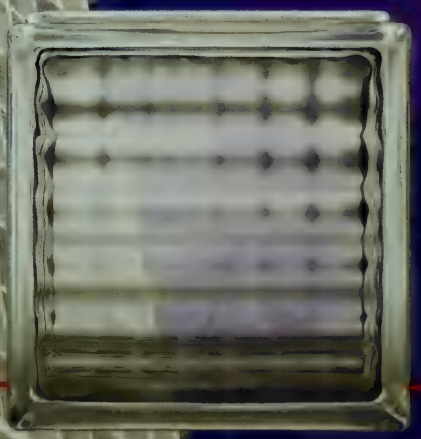
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INQUIRY CARD

AGA KHAN continued from page 73

people's physical environments, developed in different societies, different parts of the world, different climatic conditions, different material conditions. The object has not at all been to impose a philosophy; on the contrary, it has been simply to say to people you have a choice."

But if the awards program has achieved its original goals, how can it remain important? It's obviously not for me to say, but I'll give three reasons anyway why the program will continue to be relevant.

One, it deals, more than any other major award, with what will probably be the great political issue of the next generation: the survival

IT DEALS, MORE THAN ANY OTHER MAJOR AWARD, WITH THE GREAT POLITICAL ISSUES OF THE NEXT GENERATION.

of the planet. Degradation of the natural environment, depletion of resources, overpopulation: these issues are more critical in much of the Muslim world than they are—as yet—in the West. The awards tend to be about sustainable environment because in the so-called Third World, there usually isn't the accumulation of excess capital that allows rich countries to afford architecture that demeans the environment.

Two, it addresses the issue of cultural identity. We live in a paradoxical world where everyone is becoming more alike (drinking Coke, watching CNN) and, at the same time, trying to become more different, as formerly unified nations split up into ethnic enclaves—not only in Russia and Yugoslavia, but perhaps soon in Quebec and Scotland as well. Architecture is one of the most powerful expressions of both halves of the local-global paradox. It can speak of membership in a world culture, and it can speak of ethnic identity.

Three, it is one of the few bridges between the world of Islam and the world of Europe and the West. The recent bombing of American embassies by what are described as Muslim terrorists is only the latest event in a deepening misunderstanding. As the commencement speaker at Brown University in 1996, the Aga Khan addressed this problem head on: "The Muslim world is noted in the West, North America and Europe, more for the violence of certain minorities than for the peacefulness of its faith and the vast majority of its people. The words 'Muslim' and 'Islam' have themselves come to conjure the image of anger and lawlessness in the collective consciousness of most Western cultures. And the Muslim world has, consequently, become something that the West may not want to think about, does not understand, and will associate with only when it is inevitable."

The Aga Khan Award, through its many programs, brings together scholars and designers from all over the world to talk and think together. They discuss mostly architecture, but that's not a bad start. It's a reminder of the gulf of misunderstanding between the West and Islam that here in the United States, amazingly little is known, even among architects, about this enormously ambitious award program. Which tells us something we need to know about our own provincialism. ■

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ROYCE HALL *continued from page 91*

compelling when McKay realized that by creating terra-cotta units that would protrude from the stripes, he could increase the number of reflective surfaces and thus further enhance the sonic brilliance of the hall.

The striping becomes narrower and lighter in color in the upper parts of the wall, as in the Italian buildings that inspired Royce's design. The large square openings to the acoustical galleries, unlike anything that could have been built in the 12th century, presented a particular challenge. Phelps eventually decided to place a slim column, capped by his interpretation of a Romanesque-style corbel pulvin, at the center of each opening. Such precariously skinny columns with weighty caps are characteristic of Lombard Romanesque and, in this case, of Royce Hall.

The bumpiness of the striped walls of the lower auditorium is, however, unlike anything found in Lombardy. Indeed, the stripes might almost be seen as an allusion to the popping bricks of Royce Hall's walls following the earthquake. Nevertheless, the feeling is not of deconstruction but of an almost overwhelming mass and solidity that both expresses what has been done to the building and matches its architectural style.

"I've had people tell me they've always loved the brickwork of the auditorium," Phelps says, with a note of irritation. The walls were always plaster; the architect would like people to be aware of how dramatically the brick has transformed the hall's interior.

At the end of 1996, the final piece of the project fell into place when UCLA's administration decided that the other major rooms of the building should be confiscated from their individual departments and converted into conference rooms, a library, and a lecture hall, to be used by all the humanities departments in the building. This happened, in part, because the rebuilding project had called attention to spaces that had, for years, gone unnoticed by university officials.

For example, the room behind the three arched windows on the front had long been accessible only to members of the German department. One professor told of working in the building for decades before he realized there was a room in this location. Within weeks of its reopening, students realized that this room, and especially the balcony outside it, was the best place on campus to stage a protest and hang banners. Design has consequences; this long-forgotten space is now a hot spot for students and the administration.

Looking at the building now, picturesquely collegiate on the outside, radically changed on the inside, it's difficult to imagine that it could have emerged from crisis. Buildings of symbolic importance are always subject to reinterpretation and change, however odd that idea might seem in Southern California, where the impulse is often to tear down and start over. Royce Hall will probably have several more lives, though if the engineers' work is sound, future changes won't be forced by the danger of collapse.

Royce Hall was not preserved in the conventional sense. It has, rather, been saved and transformed. Phelps says his goal all along was to make Royce Hall what it would have been if David Allison, its original designer, had known what is known today about how to help buildings survive earthquakes, and if he'd had a more generous budget for interior embellishments. That's why, even though Phelps immersed himself in study of the Lombard Romanesque while working on the design, he bristles if you call it a historic preservation project. "It's not preservation, it's architecture," he says. Oakley agrees: "On campus, everything is always changing. But the good buildings have many lives." ■

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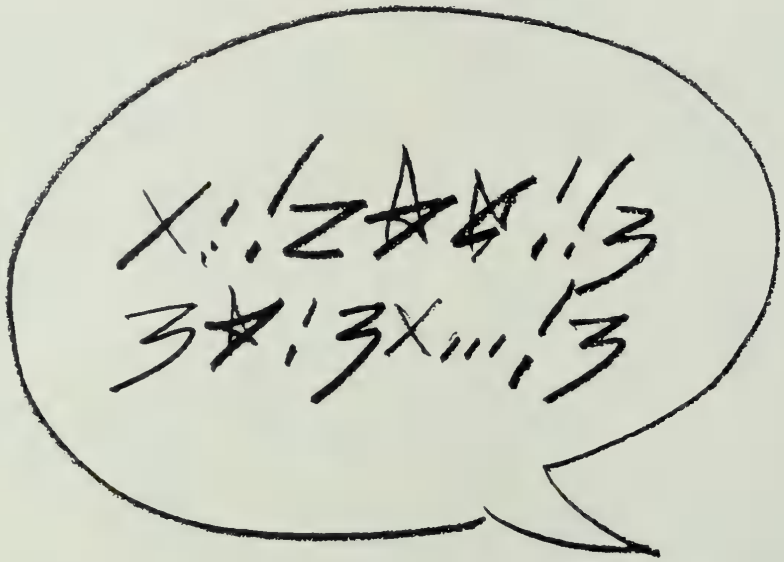
The award winning, ***Back from the Brink: Saving America's Cities By Design***, continues to be used to galvanize community action. ***Becoming Good Neighbors: Enriching America's Communities By Design***, the next Accent on Architecture documentary, will be released in 1999. For more information, please fax (202) 626-7420.

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MEGAHOUSES *continued from page 78*

Laurinda Spear of Miami's Arquitectonica says her firm doesn't create "one big block of mass. We try to break down the volumes. Often in South America we build high, dilapidated-looking walls around the periphery so you can't see the houses at all."

Says Lee Skolnick: "I studied music before I studied architecture, so I know you have to use 12 tones to compose a fugue or a sonata. The way I deal with scale is by manipulating the site. Like Italian hill towns, I have pieces that meander around the land. I do different spaces for the owner to go to at different times of the day."

"I am more courtyard- and cluster-oriented," says Ned Forrest, "so my houses have the scale of a farm or village. Like Frank Lloyd Wright, I want to be of the land, not on the land."

Yves Ghiai of Heydar Ghiai & Sons in San Francisco is designing a 15,000-square-foot house there on the principles of Persian palaces. "I've kept it horizontal, with lots of courtyards like the ones at the Alhambra Palace, with water effects," he says. "I've layered the facade with porches, balconies, and layers of glass."

Financial matters

Considering the deep pockets of their clients, one might assume that megahouse architects are pulling in fairly sizeable fees. But while many have made a substantial living designing massively budgeted homes, this is not always the case.

"The clients are very demanding in terms of service, and very few will pay you by the hour," says Lee Skolnick. "We are not as good at negotiating as our successful business clients, so our fees go way down. We feel we can't let someone else underbid us, because the house commissions lead to other jobs. Our clients are on the boards of institutions and museums that we like to work for—and do work for."

Bart Voorsanger, on the other hand, says he would never do corporate work for his residential clients. "I treat house clients in a different way," he says. "I never bridge over, because the issues get confused. I want my relationship to be unique."

The right architects?

Another question is whether wealthy clients are choosing America's better architects to design their modern megahouses. It seems that, on the whole, they're not. According to the *Palm Beach Post*, there are 19 new homes ranging from 23,000 to 84,000 square feet on the Florida coast between Palm Beach and Jupiter Island. The number of enormous houses there is unrivaled anywhere in America. But Stanley Tigerman is the only big-name architect hired to work on any of these pricey projects.

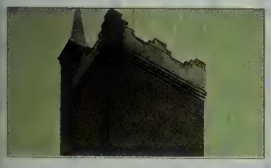
Perhaps architects should think about how to better reach the kinds of clients who are willing to spend $5 million to $20 million on a house, so that these clients don't go to developers and decorators instead.

They might start with Samuel G. White's new book, *The Houses of McKim, Mead & White*, and continue with monographs on Addison Mizner, Carrère & Hastings, Delano & Aldrich, and Harrie T. Lindeberg—the great house architects of the early 20th century who, as it turns out, were also highly adept at navigating the upper circles of society.

Architects today are as educated as brain surgeons. They are up-to-date about technology, materials, cost controls. But how to communicate with the super rich isn't taught in architecture school—though more designers might want to take a crash course if they want to be involved in creating today's castles. ■

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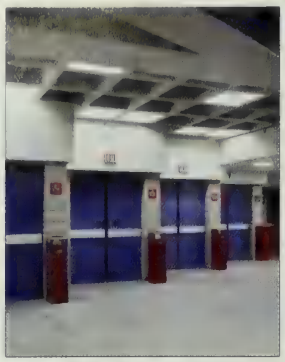


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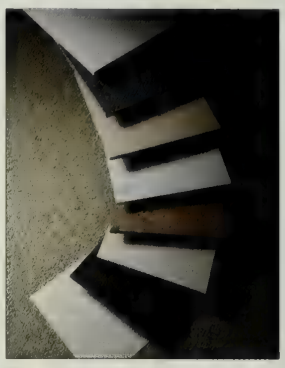


Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.

Xypex Chemical Co.

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Innovative Marble & Tile Inc.

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Heat-N-Glo

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Mortar Net Weep Vents

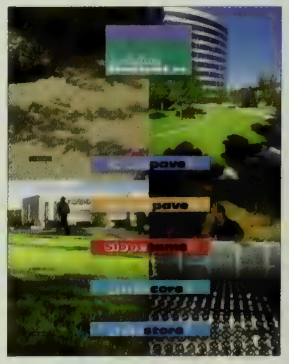


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Mortar Net

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Invisible Structures, Inc.

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CertainTeed Corporation

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A kiln-fired, interlocking clay roof tile designed to look like thick slate with a breaking strength greater than 300 pounds; impervious to freeze-thaw degradation with less than 1% moisture absorption; color will not fade, flake, or effloresce—offered in slate gray, slate red, montpelier green, plumstone, and brunswick black. Sixty-year limited, transferable warranty. 1-800-699-9988.

CertainTeed Corporation

CIRCLE 164 ON INQUIRY CARD

NCA's Universal Design '98



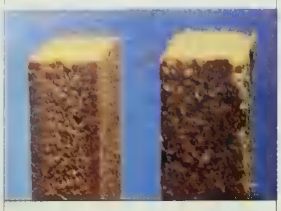
The National Center on Accessibility will host Universal Design '98: Methods to include the Widest Spectrum of Users, People with Disabilities & Older Adults in Parks, Recreation & Interpretive Environments December 7-11, 1998 in Houston, TX. See the NCA Homepage or call for training course details: NCA, 5020 State Road 67 North, Martinsville, IN 46151. E-mail: nca@indiana.edu F: (765) 342-6658 or T: (765) 349-9240. www.indiana.edu/~nca

NCA

CIRCLE 165 ON INQUIRY CARD

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Duraflake MR moisture-resistant particleboard absorbs less moisture & exhibits minimal thickness swell compared to standard particleboard. For interior applications where exposure to high humidity & intermittent contact with water is common. It has a fine surface for laminating & exceptional strength. Applications include bathroom & kitchen cabinets & counters, casework, display fixtures, entryways & other moisture-prone areas. To request information call 1-800-887-0748 ext. 300.

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A/D Fire Protection

CIRCLE 167 ON INQUIRY CARD

Interactive Whiteboard

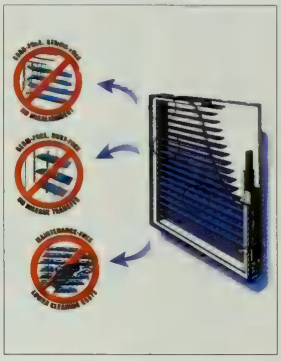


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AISC, Inc.

CIRCLE 170 ON INQUIRY CARD

Kolbe's Interactive Design System

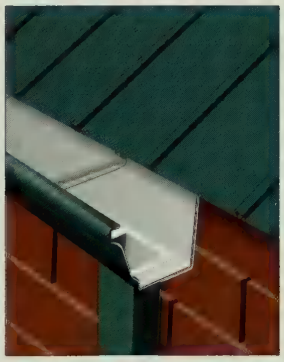


Kolbe & Kolbe has developed an interactive design system on CD-ROM (KIDS) to save architects time when selecting windows & doors for construction projects. KIDS presents on-screen options & sizes for each window style without having to page through architectural manuals or catalogs. KIDS also offers a multimedia presentation about Kolbe & Kolbe including a plant tour, company history, architectural achievements & product info & specs. Call 1-800-955-8177.

Kolbe & Kolbe

CIRCLE 171 ON INQUIRY CARD

New Rainwear From Petersen Aluminum



Announcing the addition of a complete line of gutters, downspouts & accessories. Gutters feature the standard ogee profile. Downspouts are available as square or rectangular in a variety of widths. These products feature their PAC-CLAD Kynar 500 finish and can be manufactured in .032 aluminum, 24 & 26 gauge steel in colors to match their full line of metal roofing products. For info about this new product line, call 1-800-344-1400 or visit their website at www.pac-clad.com

Petersen Aluminum Corp.

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Spiral Stairways & Custom Stairs



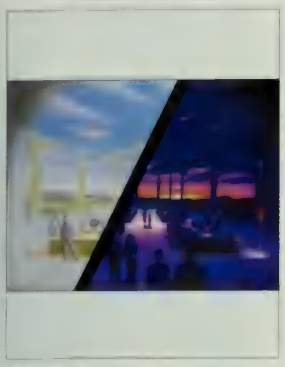
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Hydrel

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Hydrel's 7100 Series Architectural Lighting System provides high performance with maximum uniformity and control. Eight standard light distributions. Standard internal glare control. Multiple mounting capabilities. Contemporary styling to complement any architectural statement. Up to 175 watts HID.

Hydrel

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Sun Valley Lighting manufactures an extensive line of Standard & Custom cast aluminum lighting poles & fixtures in all period styles. Our 50 years of design & manufacturing experience provides you with unexcelled product quality. Our staff of designers, engineers, and tool makers are here to assist you. Our in-house foundry assures quality and prompt delivery at competitive costs.

Sun Valley Lighting

CIRCLE 177 ON INQUIRY CARD

The New Saturn



The newly expanded Saturn series offers a wide variety of contemporary and classic finishes coupled with three diffuser materials. Shown here is the SNC-277D-4DP1 which couples a Brushed Brass finish and cable hanging system with a White Acrylic diffuser. This fixture will accommodate four 26W quad fluorescent lamps. The Original Cast Lighting Inc. 6120 Delmar Blvd., St. Louis, MO 63112, 314-863-1895, fax 863-3278, www.theOCL.com.

The Original Cast Lighting

CIRCLE 178 ON INQUIRY CARD

Ushio's Ultraline™ 10,000 hour MR-16

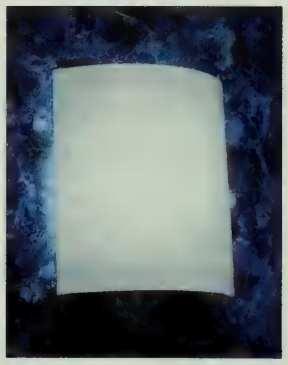


Ushio's Ultraline™ 10,000 hour MR-16 lamps are rated at more than twice the life of any MR-16 lamp on the market. The Ultraline™ series maintains consistent color throughout the life of the lamp & the halogen capsule protects ultraviolet sensitive objects by eliminating 90% of the harmful UV emissions. Available in medium, wide & soon to be released spot beam spreads. Ushio America is located at 10550 Camden Drive, Cypress, CA 90630. Call (800) 218-7446. www.Ushio.com

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PERFOS Wall Sconce features a perforated metal shield with luminescent acrylic liner in a curvilinear shape. Solid end sections enclosed with white acrylic panels form an elegant appearance. ADA compliant sconce uses compact fluorescent lamps up to 36 watts. Mounts vertical or horizontal. Other PERFOS styles, including Pendants, available. EXCELITE Inc., 4500 6th Ave., Altoona, PA 16602. T: 814-943-1155, F: 814-946-1057.

EXCELITE Inc.

CIRCLE 180 ON INQUIRY CARD

Flexible Rope of Light



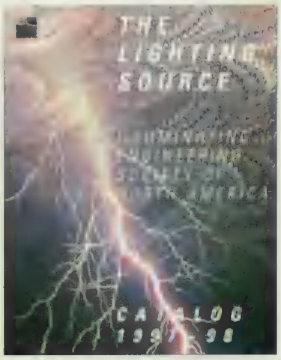
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Outwater Plastics Industries

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Illuminating Engineering Society of North America

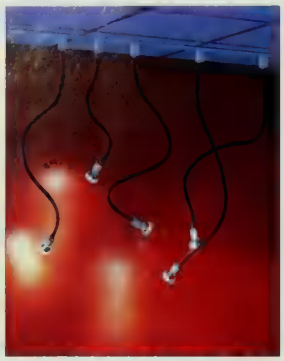


The LIGHTING SOURCE by the IESNA offers a vast selection of standards and publications for the lighting professional. The IESNA has 10,000 members and offers many benefits. If you wish to receive a a complimentary copy of the catalog, please call Albert Suen at T: (212) 248-5000, F: (212) 248-5017, or e-mail bethbay@aol.com.

IESNA

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Snakelight

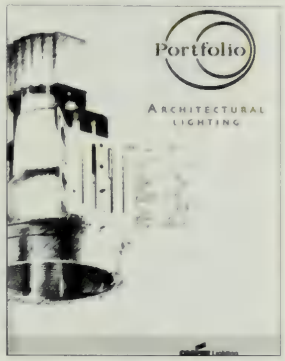


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MD Enterprises, Inc.

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Cooper Lighting's Portfolio brand of architectural-grade recessed downlights has expanded to include over 130 luminaries accepting compact fluorescent, incandescent and H.I.D. lamp sources. Portfolio downlights feature matching apertures for consistent visual appearance, and equal cutoff to lamp and lamp image for glare-free illumination in all optical distributions.

Cooper Lighting

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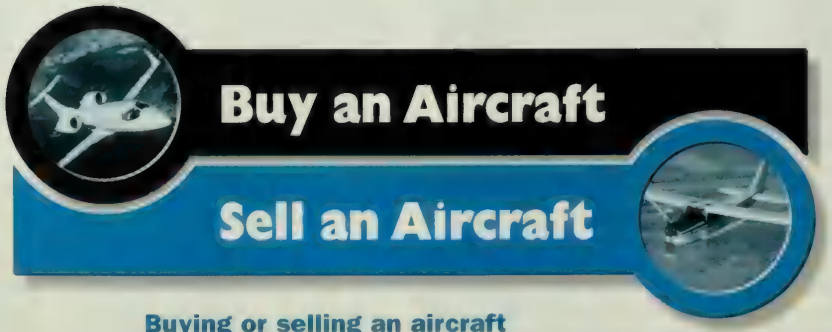


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The Associate Vice Chancellor - Capital Projects provides operational management for the Department of Planning, Design and Construction, with a combined total of 100 FTE and operating budget of $5 million; the AVC-CP is the Campus Architect, Campus Building Official and Historic Preservation Officer and serves on the highest level campus policy committees. Manages all processes of physical, environmental and community planning, building assessment, facility renewal and replacement, major and minor capital projects and asset management. Assists with the development of a Campus Master Plan and the implementation of a seismic safety of all campus facilities. Qualifications: Requires architectural license with the State of California; advanced degree preferred, and significant upper level related experience. Must have knowledge of methods, practices, and procedures of capital programming for large educational institutions. Knowledge of familiarity with appropriate laws, regulations and codes which affect capital project work in the State of California. Salary commensurate with qualifications and experience. Closing date: Open until filled (review of applications begin 10/30/98). Nomination letters invited. Submit letter of application, resume, and the names of three current references to: Karen Burke-Johnson, Job #09-800-80, University of California, 2200, University Ave., Rm. 7G, Berkeley, CA 94720-3540. Or email to: applyucb@uclink.berkeley.edu. EEO/AA.

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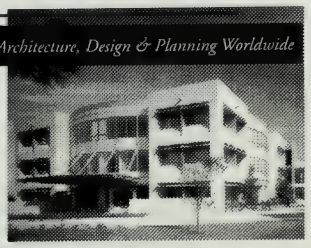
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Bachelor's degree in architecture with 1 year's experience in construction field. Applicant should have a work history or education training in AutoCAD R13 or 14. Duties include site and environmental analysis, schematic design, code research, cost estimate, interior design, preparation of construction documents and specifications, construction administration, project management, consultation with clients to determine their requirements and assistance in preparing bids for various project types including residential, educational, religious, medical facilities and offices, all under supervision of project architect. Salary $26,000. Send resume to: Job order #8042354, Job Service Grand Forks, 1501 28th Ave. S, PO Box 13637, Grand Forks, ND 58208-3637.

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DEPARTMENT HEAD ARCHITECTURE

Nominations and applications are invited for the position of Head of the Department of Architecture, available July 1, 1999.

Candidate must hold an accredited master's degree in architecture, or its equivalent, and have attained a distinguished record of professional, scholarly and academic accomplishments. Candidates must be licensed to practice architecture in the United States or be eligible for reciprocal licensure. Previous administrative experience desirable.

The program is fully accredited by NAAB and offers a five-year professional Bachelor of Architecture degree. Emphasis is placed on the studio environment supported by a state-of-the art computer lab, semester-long Rome study program, and newly endowed community design center. The Department also offers a non-accredited M.S. Architecture degree and an optional pre-professional B.S. degree. It currently employs 18 full-time faculty members.

The Department of Architecture and the Department of Landscape Architecture comprise the newly formed School of Architecture and Landscape Architecture within the College of Arts and Architecture. Other academic units include the Schools of Music, Theatre Arts, and Visual Arts and the Departments of Art History, and Integrative Arts. The Department Head reports directly to the Dean of the College. The Department of Architecture also maintains an active relationship with the Department of Architectural Engineering in the College of Engineering.

Candidates must be qualified for tenure. Rank and salary negotiable.

Nominations, or letter of application expressing one's view toward architectural education, along with a curriculum vitae and names of at least three references, should be forwarded to:

Professor Daniel Willis, Chair, Search Committee
The Pennsylvania State University
111 Arts Building
University Park, PA 16802

Review of applications will begin November 30, 1998, and continue until the position is filled.

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The Pennsylvania State University seeks a visionary leader to fill the position of University Architect. Penn State is in the early stages of a half billion-dollar capital construction program. The successful candidate will help to mold the architectural character of the institution for the twenty-first century. The University Architect is responsible for providing programmatic leadership to ensure architectural quality at the University Park Campus and 23 other campus locations across Pennsylvania. Other major responsibilities include master planning for all Penn State campuses; making design and master planning presentations to University executives and Trustees; providing leadership for the selection of architects, including architect selection policies and procedures; acting as a principal contact with various municipal governments and planning agencies; and coordinating zoning issues for University Park development projects. The University Architect reports directly to the Assistant Vice President for Physical Plant and has frequent contact with the President, Provost, and Senior Vice President for Finance and Business. Qualifications include a Master's degree or equivalent in Architecture; five to seven years of experience in architecture and master planning; and professional registration as an architect. Candidates must have a proven record of architectural achievement, be committed to a team approach, have excellent leadership skills, and be able to communicate diplomatically with a variety of audiences. Previous experience in higher education is preferred. Review of applicants will begin immediately and continue until position is filled. Send letter of application, resume, three current references, and salary requirements to: Employment & Compensation Division, Job #: R-3536, 120 S. Burrowes Street, University Park, PA 16801, or Fax to (814) 865-3750. Penn State is committed to affirmative action, equal opportunity and the diversity of its workforce.

DEPARTMENT OF ARCHITECTURE
UNIVERSITY OF CALIFORNIA, BERKELEY

The Department of Architecture at the University of California at Berkeley is seeking candidates for a tenure-track assistant professor position to teach criticism and theory. The appointee must be able to present an interdisciplinary approach to the historical, critical, cultural and theoretical study of architecture in a systematic and comprehensive manner. Candidates should exhibit scholarship and strong interests in the ways in which various methodologies can apply to the innovative analysis of the built environment and the means for changing it. Candidates must have an advanced degree (Ph.D. in Architecture or related discipline, or Masters of Architecture with strong evidence of scholarly publication) and be capable of teaching in lecture, seminar, and studio formats. Send a brief statement of interest, curriculum vitae, and names and addresses of three potential references to: Donlyn Lyndon, Chair, University of California, Department of Architecture, 232 Wurster Hall #1800, Berkeley, CA 94720-1800. Completed materials must be postmarked no later than December 15, 1998. Applicants postmarked after December 15, 1998 will not be considered. Projected date of appointment is July 1, 1999. The University of California Berkeley is an Equal Opportunity/Affirmative Action Employer.

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The School of Architecture and Design invites applications for three faculty positions: one full-time position in architecture, one part-time position in architecture (Rome Study Abroad Program), and one full-time position in interior design, beginning Spring 1999. The School offers five degree programs: five year B. Arch. (NAAB accredited), four-year B.S. in Architectural Studies, four-year B.S. in Interior Design (FIDER accredited), four-year B.S. in Graphic Design Communication, and four-year B.S. in Industrial Design. Position 1: Architecture Program—Upper Level Studio: Primary responsibilities include teaching in and coordinating 5th year studios (systems synthesis/thesis) and one other course (in candidate's area of specialization) each semester. Candidates should have substantial professional practice experience and knowledge of building systems. A Master's degree in architecture. Seven years minimum practice/teaching experience, and architectural registration is required. Position 2: Architecture Program—Part-time Faculty/Coordinator for Study Abroad Program in Rome: Primary responsibilities include teaching the core studio course, developing the study abroad curriculum, and coordinating the studio course with other courses and activities on the College's "Rome Campus" at John Cabot University. Candidates must be fluent in Italian and English. A professional degree in architecture and seven years minimum practice/teaching experience is required. A Master's degree in architecture and teaching/practice experience in the U.S. is desirable. This is a permanent part-time spring semester position with appointment beginning December 1998. The position will be a joint appointment with the College and John Cabot University. Position 3: Interior Design Program—Upper Level Studio: Primary responsibilities include teaching in and coordinating an upper level interior design studio and one other course (in candidate's area of specialization) each semester. Candidates should have substantial professional practice experience. A Master's degree in interior design or allied design field and seven years minimum practice/teaching experience is required. NCIDQ certification is preferred. Candidates should have previous teaching experience and demonstrate strong creative achievement (design, scholarship, or professional practice) in their primary field. Send letter of application, curriculum vitae, portfolio with examples of professional and academic work, and the names, addresses, and telephone numbers of three references to: Gary J. Crowell, Dean, School of Architecture and Design, Philadelphia College of Textiles & Science, School House Lane & Henry Avenue, Philadelphia, PA 19144-5497; tel: 215/951-2828; fax: 215/951-2110; e-mail: crowellg@philacol.edu. Review of applications will begin November 15, 1998 and continue until positions are filled. Philadelphia College of Textiles & Science is an Affirmative Action/Equal Opportunity Employer.

PROFESSOR OF STRUCTURAL TECHNOLOGY

The School of Architecture is seeking a candidate to be the primary instructor in a revised curriculum in structural technologies. Candidates for this position should be prepared to take a leadership role in the development of innovative and effective course work. The candidate would teach three core lecture/lab courses in structural planning and analysis and either an upper-level seminar course or a design studio. Please send a letter of application and resume to Professor Stephen Jacobs, Chair, Search Committee, School of Architecture, 6823 St. Charles Avenue, Tulane University, New Orleans, Louisiana 70118-5871.

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Director of the Hamer Center for Community Design Assistance

A joint faculty position beginning Summer 1999 in the
School of Architecture and Landscape Architecture
College of Arts and Architecture
THE PENNSYLVANIA STATE UNIVERSITY

The newly formed Hamer Center for Community Design Assistance is organized to utilize the expertise of faculty and students in the School of Architecture and Landscape Architecture (SALA) to address a range of issues affecting the quality of rural and urban environments focused in the Commonwealth of Pennsylvania. Hamer Center activities in community service and outreach will entail two distinct but related types of undertakings: 1) applied research; and 2) theoretical investigations. Hamer Center projects will address community problems in such areas as community-focused design, rural planning, affordable housing, development of design guidelines, park and recreation planning, environmental and ecological analysis.

SALA is seeking the founding director for the Hamer Center -- an individual capable of leadership and management for all functions of the Center. POSITION RESPONSIBILITIES: 1) collaborate with SALA faculty to refine the structure and vision for the Center; 2) serve as a highly visible spokesperson to promote excellence in the design and stewardship of the natural and built environment; 3) coordinate faculty research agendas with Center initiatives; 4) seek, write, and administer research grants; 5) conduct research and pursue creative activity in community, rural, and/or urban design; 6) engage in teaching at undergraduate and graduate levels; and 7) manage Center resources and staff. This important joint faculty position in Penn State's new School of Architecture and Landscape Architecture will hold rank commensurate with individual qualifications.

The competitive candidate should hold a professional degree in architecture, landscape architecture, physical planning, or urban design, as well as an advanced degree. Five years minimum experience in a community design center or relevant professional/academic experience; excellent communication and interpersonal skills; demonstrated ability in fund raising; and evidence of leadership in community issues are highly desirable.

Send a letter of application including a statement describing relevant experience in each of the seven responsibilities listed above, a resume, salary expectations, and names/addresses of three reference to:

Chair, Hamer Center Director Search Committee
c/o School of Architecture and Landscape Architecture
210 Engineering Unit D, The Pennsylvania State University
University Park, PA 16802-1429
(814) 865-9511

Applications received by January 12, 1999 will be assured consideration
AA/EOE - An Equal Opportunity University

DIRECTOR, SCHOOL OF ARCHITECTURE

The University of Illinois at Urbana-Champaign invites nominations and applications for the position of Director of the School of Architecture. The Director of the School of Architecture reports directly to the Dean of the College of Fine and Applied Arts. Responsibilities include: managing the School, participating in its academic life and developing a vision for its future; promoting the School's education and research activities; fundraising and development; recruiting and retaining high-quality faculty and students; and maintaining academic excellence in class instruction. The director also represents the School to the broader University, alumni, donor, business, and professional communities, and to the public, both nationally and internationally. The successful candidate will demonstrate outstanding accomplishment in her or his area of professional specialty appropriate to being granted a position of full professor with tenure. She or he is expected to have a distinguished academic and research record. A professional degree in architecture with a license to practice architecture, a Ph.D. in architecture or in a related field, or an equivalent record of achievement in architecture is expected. The candidate should be aware of contemporary architectural discourse and scholarship. She or he must show administrative experience, including sound management of budgets and personnel, have a proven ability to work with a diverse faculty and student body, and must possess excellent communication skills. The position, which will be available August 21, 1999, is a full-time appointment. The salary will be commensurate with qualifications. For full consideration, nominations and applications should be received by December 1, 1998. The search will continue until the position is filled. Applicants should submit a letter of interest summarizing their qualifications; a curriculum vitae; a statement of vision regarding architecture and architectural education, and the names of at least three references. Mildred Griggs, Chair, School of Architecture Director Search Committee, University of Illinois at Urbana-Champaign, 115 Architecture Building, 608 E. Lorado Taft Drive, Champaign, IL 61820. Inquiries may also be sent to her email address: m-griggs@uiuc.edu. Further information about the School may be found at: http//www.arch.uiuc.edu/ The University of Illinois is an Affirmative Action, EEO. Women and minorities are encouraged to apply.

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DEPARTMENT OF ARCHITECTURE

Position: Assistant or Associate Professor of Architectural Design

The Department of Architecture is seeking candidates for a tenure-track position at the assistant or associate professor level in architectural design. Candidates must have a professional degree in architecture and be qualified to teach architectural design as well as courses in another area of the curriculum, such as building technology, architectural theory, professional practice, and visual studies. Obligations of this position are teaching, design practice and/or creative research, scholarly activities, and administrative responsibilities. Appointment criteria include teaching experience, academic and professional qualifications such as advanced degrees and professional registration, as well as honors, awards, publications, and other evidence of outstanding scholarly and/or creative work. Send letter of application, curriculum vitae, and an abbreviated sample of your work to: Professor Andrea Simitch, Design Search Co-Chair, Department of Architecture, 143 East Sibley Hall, Cornell University, Ithaca, N.Y. 14853-6701.

Rank and salary will be commensurate with experience. Review of applications will begin November 15 and continue until the position is filled. The appointment is expected to begin Fall 1999.

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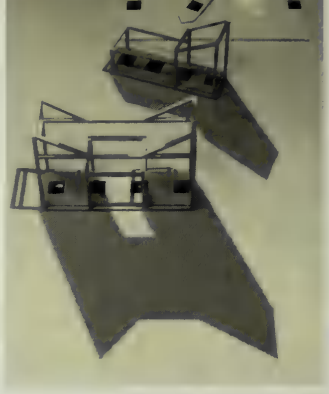
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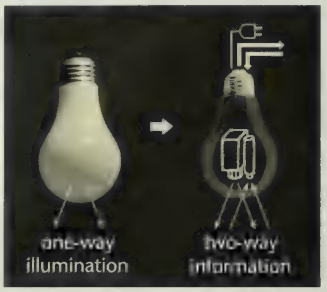
BY CHARLES LINN, AIA



An ordinary light bulb, proposes Ph.D. candidate John Underkoffler, functions somewhat like a projector connected to a computer's video output. Both are capable of presenting us with information, but with completely different levels of resolution. The light bulb produces a single pixel of "information" (on or off) that is spread across an entire room. The projector can produce images at a much higher resolution, say 1,024 by 768 pixels. But either at low or high resolution, both devices are for output only.

While developing his thesis, Underkoffler, who works with Hiroshi Ishii's Tangible Media Group at the Massachusetts Institute of Technology's Media Laboratory, built a prototype "bulb" that is capable of projecting information at a high resolution, but with an additional property. Tucked inside the envelope of Underkoffler's I/O (input/output) Bulb is a video camera that gathers information at the same time an integral projector outputs it. The I/O Bulb sends the video input to a computer for calculations, then outputs the results through the projector.

One of the applications Underkoffler developed for his bulb is Urp, for "urban planning" system, which uses a tabletop to represent and accommodate sites, physical models of buildings, and roads. With Urp, designers can visualize such things as how buildings will shade one another at different times of day, or how reflections off the glazing of buildings might impair the vision of drivers on a nearby road. It can demonstrate how wind currents will flow between buildings.



Though a good computer modeling system can do similar things, there is a significant difference in watching Urp work. Although the properties of the physical model are entered in numerical form on a keyboard much as they are with conventional computer simulation programs, with Urp the designer can view a simulation of shadows, reflections, or wind currents while moving three-dimensional models of the building around the site—in real time. Urp uses the video camera inside an I/O Bulb to locate the three-dimensional models and to track their positions as they are moved. The computer processes this information and uses the video output to project a representation of the phenomenon being tested onto the site. So while one would have to rotate a two-dimensional representation shown on a computer screen in order to view other perspectives, (the computer must create a new view each time the representation is rotated), the Urp's model is three-dimensional, tactile, and instantaneous.

The tools used to indicate variables such as time, sun, and wind direction couldn't be simpler. Time is indicated by the moving hands of a clock on the tabletop; sun and wind directions are indicated by arrow-shaped pointers. Other properties that may be added to Urp in the future would allow shadow manipulation for specifying latitude and season, automatic zoning criteria that could warn a designer when height or proximity guidelines are being violated, and the capacity for two designers to collaborate jointly from different locations.

A logical extension of the I/O Bulb is what Underkoffler calls the Luminous Room—a space where a number of I/O Bulbs would be networked and the gathering and outputting of information would cover every surface.

The I/O Bulb and Luminous Room hold enormous potential for future applications beyond the modeling of architectural or urban spaces. Already the technology has been applied to mock up and prepare equipment layouts for the production of holographic images, and to simulate the flow of fluids around objects.

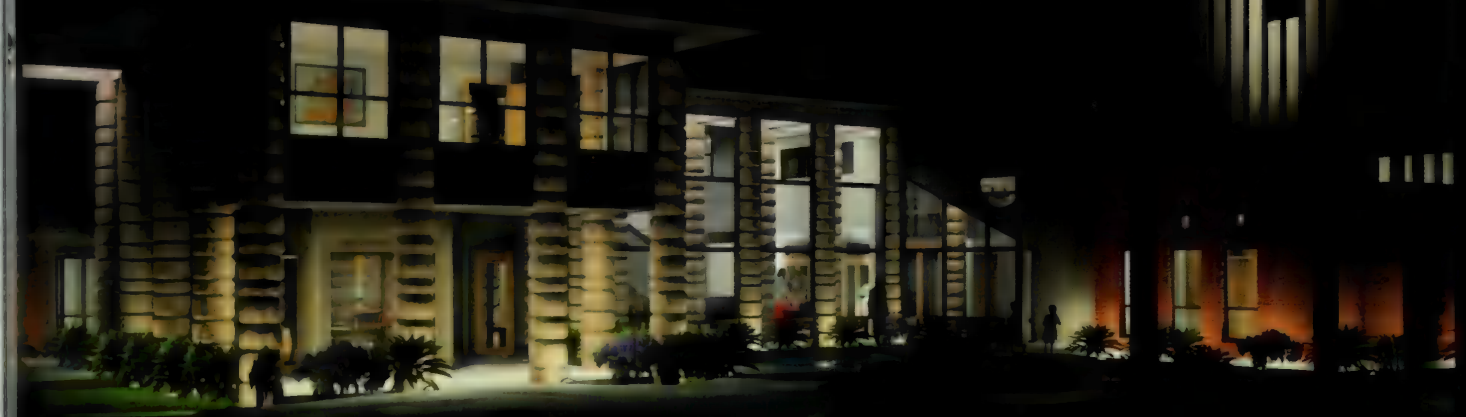
But Underkoffler plays down the use of the Luminous Room for some of the more obvious applications, such as a virtual-reality-based environment that could be shared by more than one person without the use of cumbersome headsets. "Why compete with reality?" he asks. Still, Underkoffler has found that nearly everyone who experiences the Luminous Room is engaged by it. Playing with the technology, he says, invariably delights people, regardless of the task at hand. ■



With the help of a video camera, Underkoffler's I/O Bulb sends information two ways, compared to a regular light bulb's one-way illumination (above). His urban planning package system, Urp, can show wind currents (right) as well as shadows on a tabletop model (top).

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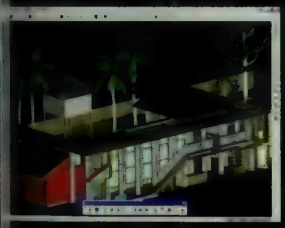


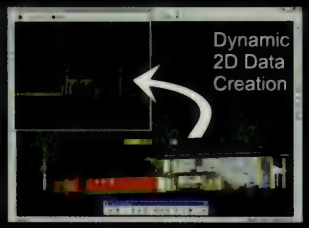
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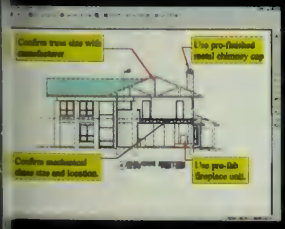


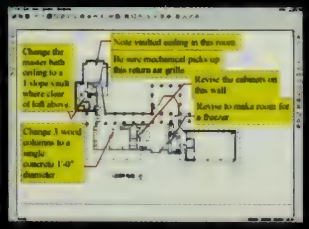
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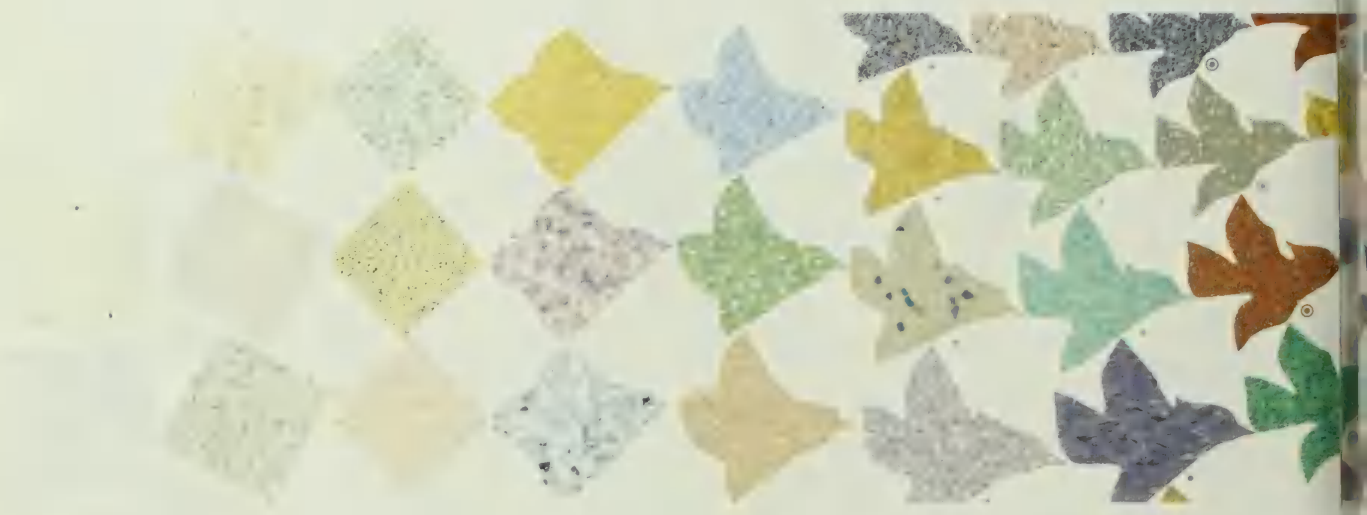


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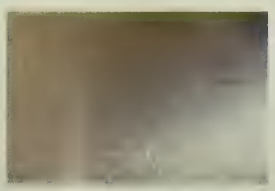
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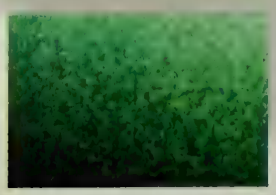
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LeCorbusier Lounger courtesy of Gordon International, NY, NY.

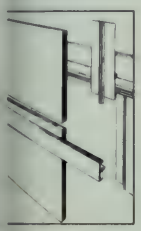
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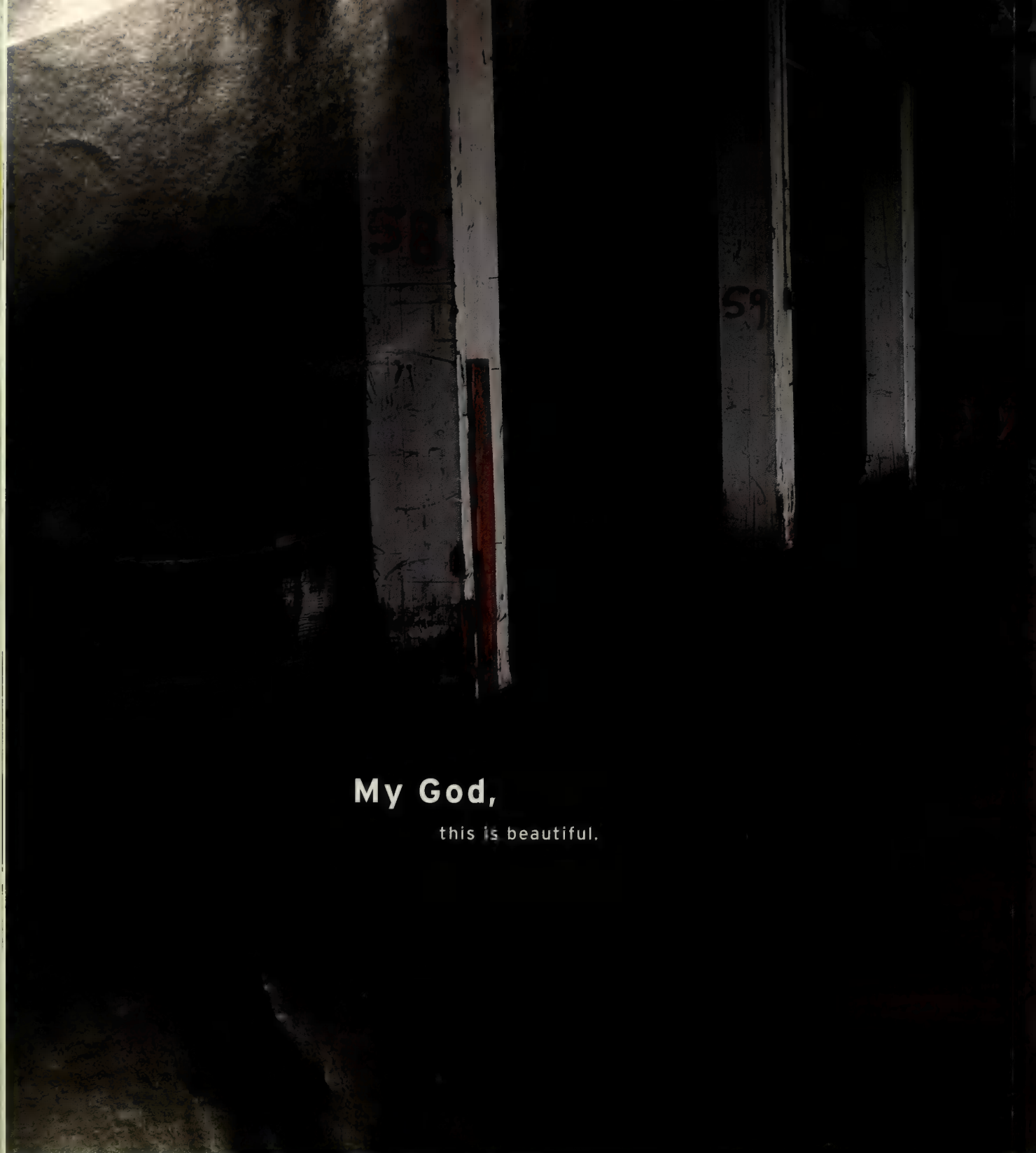
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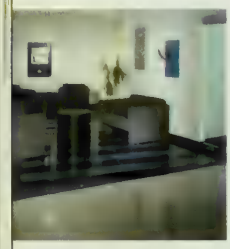
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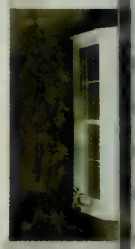
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CIRCLE 5 ON INQUIRY CARD



EDITORIAL

Taking *The Cruise*

BY ROBERT IVY, FAIA

The Cruise *is a just-released documentary film that architects are bound to talk about. It's the story—or performance—of Timothy "Speed" Levitch, a tour guide who loves New York obsessively: its streets, its buildings, its grunge, its detail. Day after day he mounts a double-decker Gray Line bus and spills out a verbal rhapsody, a riff that celebrates the power of the city, breaking down the whole urban fabric into a wealth of history and rationale for ordinary and sometimes bemused folks, weaving architectural and social history into a nonstop monologue. Levitch is funny and blindingly articulate, and although apparently emotionally troubled, he is an arch, ironic, yet passionate lover of buildings and streets, a kind of Jane Jacobs on speed.*

While we may never reach Levitch's manic level, he's a freewheeling brother of sorts to architects. Any time we travel, our sketchbooks are tucked into the briefcase, whipped out to catch polyphonic skylines or single, simple tones. We photograph incessantly, to capture or isolate reality and to relate the larger world to our own experience. As tourists, we walk with fervor, burning the physical world into our consciousness, where it can be revisited in the future to inform our own designs. Free time for us means time to love architecture.

I felt a kinship with Levitch when he interrupted a walk across the Brooklyn Bridge to hug the stones—and meant it. While I have never embraced those granite blocks, I have grazed them with my hands and traced the outline of the bridge's massive Gothic arches with my eyes. In another scene, he stands transfixed by Louis Sullivan's Condict Building and groans with comic abandon. This guy really loves architecture.

Levitch hits on a singular term that sums up his highest admiration. Michael Sorkin, writing in the pages of this magazine, talked about the "urban vibe" as an ineffable, but discernible, spirit that inhabits whole cities. Levitch's descriptive, kin to Sorkin's, is "cruise," which primarily refers to products of human design that promote the flow of energy, of freedom and individual creative potential; unlike vibe, "cruise" encompasses individual buildings and streets, as well as ensembles of architectural elements, big or tiny. In New York, the canyons of Wall Street, the Brooklyn Bridge, Greenwich Village, as well as a rusted floret on a cast-iron storefront all qualify as "cruise." For Levitch, it is a way of life. The urban grid, by contrast, represents imposed order, an arbitrary pattern that stifles creativity. Again he has a term, "anti-cruise," that is epitomized in the city's police headquarters, a monolithic, hierarchical structure. Lockup stops the flow.

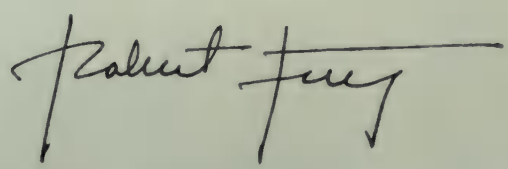
The movie, directed in a gritty style by Bennett Miller, was very "cruise" for me. I noticed that the architects in the audience laughed louder and clapped longer during the credits than the rest of the crowd. Perhaps others found Levitch's idiosyncratic life disquieting; perhaps he was too over-the-top for a public unaccustomed to such displays of ardor for inanimate objects. I left smiling, making my own list of contemporary places outside New York that qualify as "cruise." Here are a few:

London's high-tech transportation buildings, like Nicholas Grimshaw's Waterloo Station, that erupt from the city's ancient stones. They are jolts of energy, light-filled and paper-thin, reinvigorating layers of history.

Frank Gehry's office in Santa Monica, a factory-like warren of humming talent, where cardboard models with swooping roofs litter the tabletops and an armlike laser converts the actual into the virtual.

Boston's Central Artery, a churning mass of tunnels and highway construction transforming the waterfront for people. The cruise in action.

And anti-cruise? Start with gated enclaves and make your own lists. Speed Levitch, we get it. Cruise on.

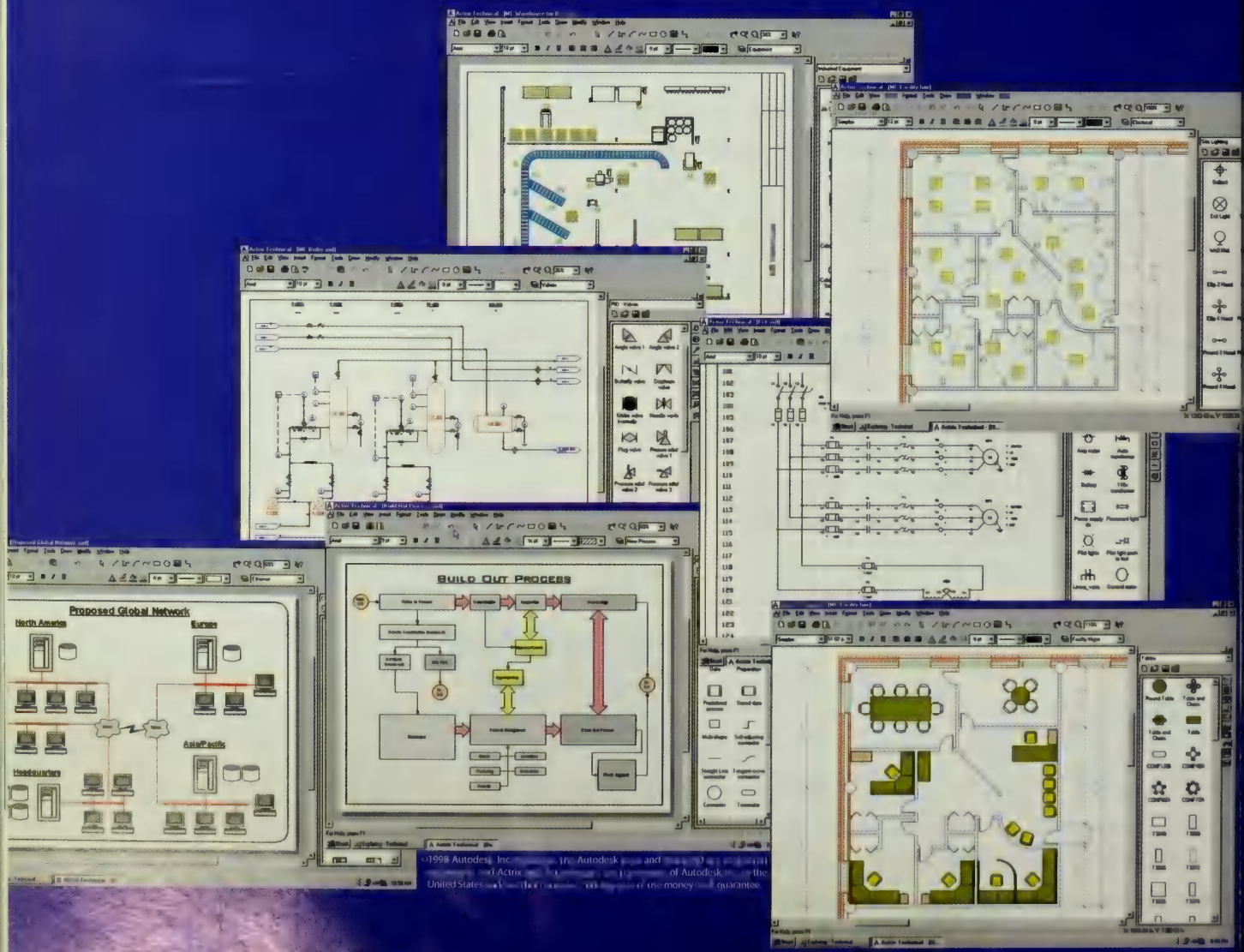


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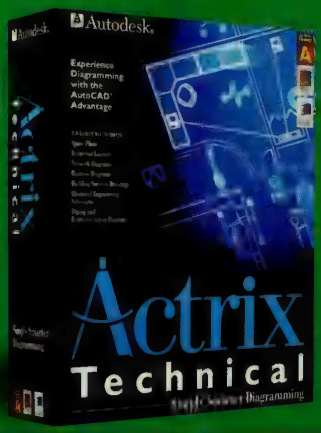


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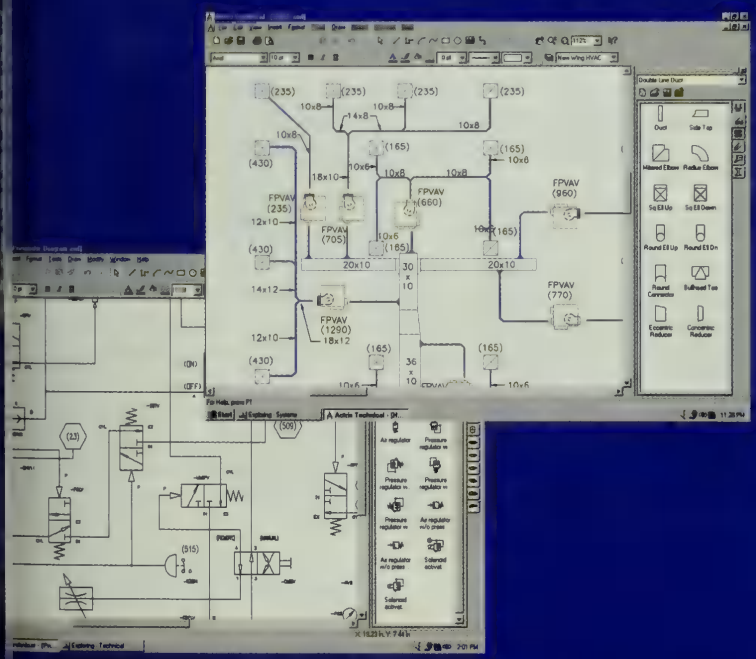
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LETTERS

An engineer for design-build

Robert Ivy's October editorial on design-build [page 15] and the article "Listening to Engineers" [page 108] are two excellent examples of stories that promote stronger relationships between architects and engineers.

As an engineer working alongside architects, I find that the evolution of project delivery methods is both exciting and necessary. True project teamwork involving owners, design professionals, and contractors can mean successful projects, delivered on time and within budget guidelines. While new project delivery methods, as well as the faster pace of projects, may be unsettling, we all need to adapt to and embrace these changes. One of the biggest challenges we face is how to maintain our professionalism as we adapt. Thank you for making us think about the new relationships and changes going on around us.

—Michael Cunningham, PE
State Farm Insurance Co.
Bloomington, Ill.

Owners, at least, like PMs

"Listening to Engineers" in the October issue was very enlightening.

Engineers and architects are concerned that their responsibilities have been eroded by project managers and construction managers. Did it ever occur to the design industry that it has itself to blame? While designers feel that project managers are, as Norman Kurtz put it, "unnecessary and don't help the process," owners feel otherwise. More project management firms are thriving in today's market despite the supposed competition of lower fee options, and more owners are developing internal project management departments. These people are better paid than most architects and engineers.

Despite Frouma Narov's claim that project managers "have no technical ability, no knowledge of owner needs," most project managers have architectural, engineering, or construction backgrounds and degrees, and many are licensed. In fact, they are often the only licensed professionals in the room, considering that on many projects, the active members of the design team are young and unlicensed.

Most project managers are very talented architects and engineers who were disgusted with the low pay, long hours, lack of respect, and internal politics that come with working in design firms. Design firms have spent the last two or three decades cutting their fees in an effort to get jobs. By doing this, they have undermined their credibility with owners, reduced their responsibilities, and staffed projects with low-paid, inexperienced professionals. Often the result is poor documentation, more liability, and damaged reputations. Perhaps design and engineering firms should spend less time griping and making disparaging remarks about project managers and others who have the respect of the owners, and instead work to fix the problems inside their respective professions.

—Charles S. Maggio, AIA
Project Director
Granary Associates
via E-mail

Keep in touch

My experience is evidence that Judson Kline gives good advice when he encourages architects to "promote interest at the high school level" [Speak Out, October, page 24]. As a sophomore in high school I had an interest in architecture and wrote letters to HOK, Richard Meier, and Helmut Jahn, and included photos of some of my renderings. Much to my surprise, I received letters from all three. Mr. Meier wrote, "It is a true gift to be so focused and directed so early in life. Keep up the good work." My enthusiasm grew.

Other letters followed to Cesar Pelli, Michael Graves, Dirk Lohan, Herbert Beckhard, and Eugene Kohn. All of them responded, many sending monographs.

I realized that the only real way to judge whether or not architecture was for me was to test the waters. Murphy/Jahn went far beyond even what Mr. Kline suggests and gave me, a 16-year-old aspiring architect, a job at the firm.

Three years and a few gray hairs later, I have completed my third internship with Murphy/Jahn. I am now an architecture student at the University of Cincinnati, and I look forward to interning at other offices around the world, continuing to test the waters. The experiences and skills I gained as a high school student at Murphy/Jahn will be with me the rest of my career. I thank all the architects who responded to my letters. The few minutes it takes to respond to a letter from a student of any age can change a career, a life, forever.

—Tom Lee
Glenview, Ill.

Glass performance questioned

In the August article "Improving Glass Performance" [page 131], Stephen Daniels writes that, according to the head of building technologies at Lawrence Berkeley National Lab, "a building with a properly glazed facade that includes these new coatings can have a lower annual heating and cooling load than one with an R-19 insulated opaque wall." Is the writer comparing the glazed facade with a totally unglazed wall or with an R-19 wall that has less efficient windows? The highest performing commercial window I've seen will, according to its manufacturer, do no better than R-6 overall. Much of this performance is due to a very large thermal break.

—Tom Van Driel
via E-mail

Technology editor Wendy Talarico responds:
The term "properly glazed" means that not only are windows with the best R-values utilized, but that the glazing is designed to interact with internal and external conditions. For example, solar gain can be maximized on cold days, actually adding heat to the building. Shading devices on warm days keep radiation at a minimum but permit natural light to enter, reducing the need for artificial lighting (which consumes energy and adds heat). Low-e glazings actually prevent heat loss during heating season by reflecting radiation back into the building. Certainly a wall that is fully glazed has a lower thermal value than one that is properly insulated to R-19, but well-placed glazing in a well-insulated wall is the best choice and will improve a building's overall energy performance.

Credits/corrections

In the October coverage of the Gap office building (page 94), William McDonough + Partners should have been identified as the design architect and Gensler as the architect of record and interior designer. Ove Arup & Partners was the mechanical/electrical/plumbing engineer. The key player on the project for Gap Inc. was Eugene Torchia.

Also in the October issue, the credits for the Praxair Distribution Center (page 98) incorrectly gave Stephen Knowles, AIA, an FAIA designation.

The architects for the Telenor headquarters in Oslo (October, page 49) are NBBJ, HUS Sivilarkitekter MNAL, and Per Knudsen Arkitektkontor as joint venture partners. The project executive is Bjørn C. Sørum.

The Zumtobel Staff product on page 168 of the November issue is the company's curved track with Solar (not Dancer) track heads.

The Sigma Sigma Commons Tower mentioned in the November Correspondent's File (page 38) was designed by Machado and Silvetti Associates; Rodolfo Machado was the partner-in-charge of the project.

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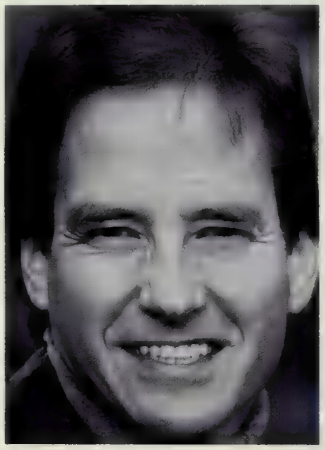
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SPEAK OUT Although sustainability issues are now becoming a priority, environmentally conscious design has declined.

CHARLES DELISIO, AIA

Charles DeLisio, AIA, is a partner in Studio DeLisio Architecture & Design, located in Pittsburgh. The firm's current work includes projects in Pennsylvania, West Virginia, and Maryland.



The increasing consideration of sustainable design issues—environmental quality, resource use, and pollution—is commendable. However, despite the growing interest in renewable energy sources and the understanding that environmental protection is imperative, most recent American architecture is indifferent to both climate and region. Being sensitive to a building's surroundings is as important as using sustainable materials.

Historically, the influences of climate, geography, and culture helped to create a rich and lasting architecture. But today, the dominant force in design is technological development and its homogenizing effects. The resultant buildings have been constructed with great expenditure of resources and at great cost to the environment.

Early this century, the development of mechanical and electrical systems, combined with inexpensive manmade energy, removed the limitations of form, site, and materials that had defined how to make a building habitable. Architects no longer had to be concerned with providing natural light and air. Engineers were proud of their ability to overcome climate-based restrictions. Energy consumption and pollution increased dramatically.

The application of new technologies also changed the profession. Architects were not directly responsible for environmental control; engineering consultants instead created a suitable indoor thermal and visual environment. Industrial production added to the forces of change, as product suppliers gained influential roles in the use of materials and systems—and in architectural discussion. The dire consequences: the adoption of a design approach based on standardized products and systems and a dissociation of design from the natural world.

In Pennsylvania, the Crown American Corporate Headquarters in Johnstown, the CNG Tower in Pittsburgh, the University Center at Carnegie Mellon, and the addition to the Capitol in Harrisburg exemplify this approach. These buildings are visually strong and technically sophisticated, but indifferent to region, climate, or tradition. Simply making use of the latest resources is not sufficient for creating timeless, engaging architecture.

In addition to contextual flaws, this approach can also lead to a frivolous waste of resources. Within Fifth Avenue Place, a recently completed high-rise in Pittsburgh, the designers attempted to create the feeling of a glass-covered atrium by means of a sophisticated lighting system installed above a faux skylight at the arcade level. The result of these complex and expensive efforts feels artificial.

In southeastern states, temporary, disposable storm protection—sheets of plywood—is required for many buildings. This requirement is a result of indifference to climate and place; the use of regionally appropriate building techniques, like wide roof overhangs and storm shutters, would make the measures unnecessary.

Some architects have been concerned that sustainable design will prove too expensive, but judging sustainability based on economics alone may prove self-defeating; a new era of inexpensive energy may again lead to indifference to region and climate.

Good architecture has always been about sensitivity to context and the natural world. Louis Kahn's best work uses natural light and materials. Le Corbusier managed to create buildings that were sensitive to place and warned against technology dominating climate. Sensitivity to nature and context can be found in the work of Bruce Goff and Luis Barragan, and today in designs by Fay Jones, Norman Foster, and Rafael Moneo.

Sustainable architecture should be less about wasteful consumption and more about issues that affect our lives and future lives. We should put less emphasis on dominating nature and try to become more aware of differing cultures. This will help us to construct richer, more diverse buildings and communities, and reestablish architecture as a source of emotional and spiritual power. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive text approval.*



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MENTORS Maintaining a dual career in teaching and architecture requires a well-disciplined balancing act.

Lawrence Scarpa is a partner in the architectural firm Pugh + Scarpa, based in Santa Monica, California. He has taught at numerous schools, including UCLA, the University of Florida, and Mississippi State University.



Many practicing architects enjoy and thrive on teaching, while many academics want to maintain an architectural practice—but achieving the right balance between the two professions can be elusive. RECORD asked architect Lawrence Scarpa to offer his perspective on getting the best of both worlds.

I've been practicing architecture since 1986 and have taught and lectured part-time at the university level since 1985 at numerous schools. In that time, I've learned that maintaining a career in both fields is no easy task. Only the most extraordinary people under extraordinary circumstances can keep a successful full-time practice alongside a full-time teaching career.

To start with, don't overcommit. Clients and, especially, students know when you are overworked and when they are not getting the attention they need. Neither clients nor students will accept less than 100 percent dedication, and perception of less than 100 percent means failure. But how to maintain that 100 percent level in multiple endeavors?

Be prepared to work harder. To teach and practice requires more than a 9-to-5 effort; to do both means working long hours. Also, you don't have to go it alone. On the practice side, consider a practice partnership if you haven't already—but be certain your partner is fully aware of the details of your professional and academic endeavors. He or she can sit in for you with a client or deal with other client needs if you have another obligation.

As for the clients, be sure they know about your teaching schedule and remind them of your commitments when you are scheduling meetings and presentations. Open communication is essential and will help reduce conflicts. I have found that if a client knows about my extracurricular duties, he or she will be accepting and not reluctant to continue working with me.

If you haven't been involved with education and are looking to start, talk with teachers and peers; consistent interaction can lead to abundant opportunities. Partnership can also help on the teaching side. Consider team teaching, especially with classes such as design studios, which require an extensive time commitment. Co-teaching will be credited the same on your resume as a solo teaching gig, but it will reduce your physical burden, as well as give you a chance to share ideas.

Most architects want to teach in the design studio, but keep in mind that studios require the most hours with students and have the most unpredictable schedules. Consider teaching a seminar; they are just as important as studio sessions. And though they require as much, if not more, planning, the instructors have better control of their time and can teach effectively within scheduled periods. Furthermore, leading a seminar allows you to choose a topic that greatly interests you. Schools and administrators are open to good ideas; if you present them with an issue you want to teach about, they will likely accept it as a course.

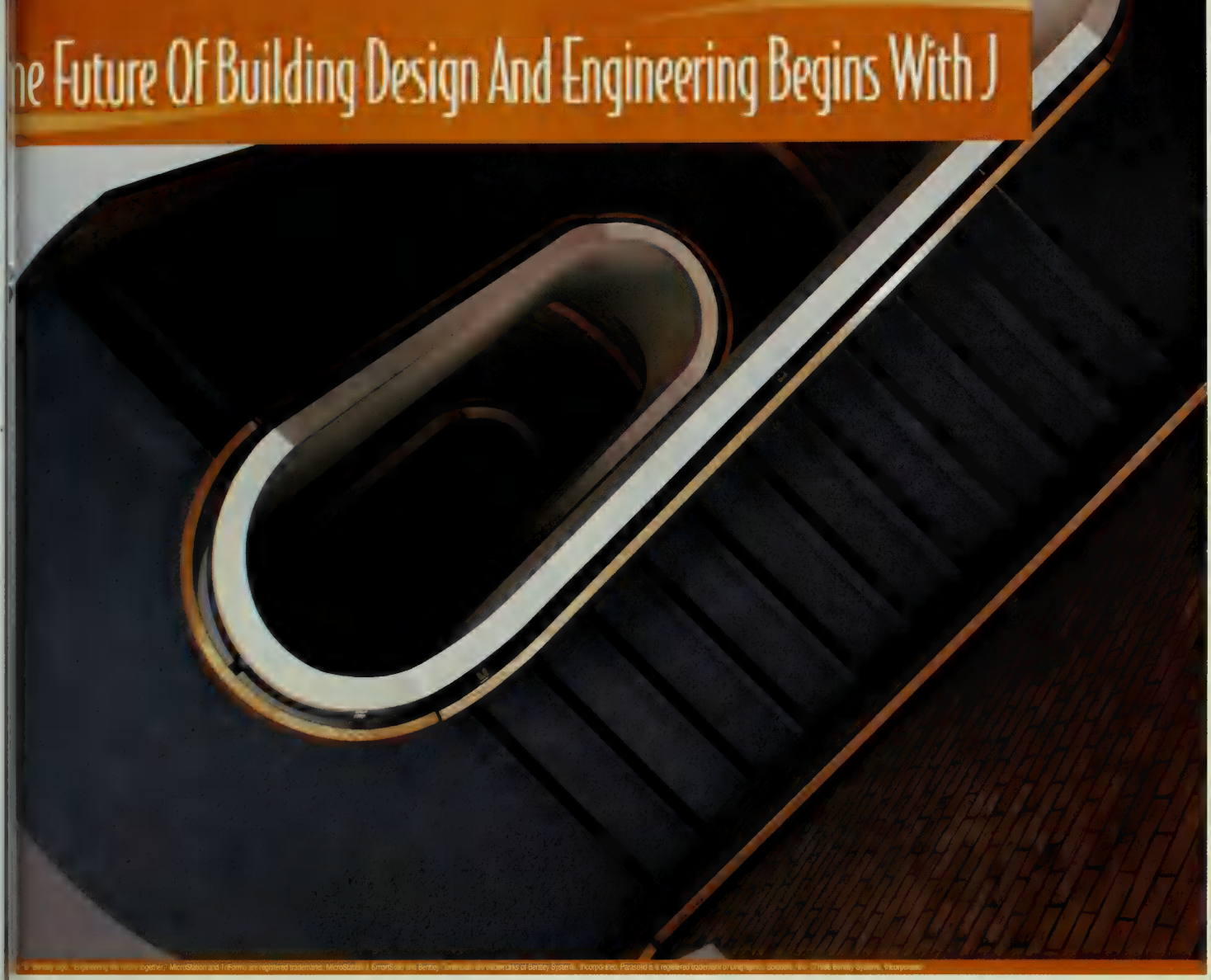
Good ideas and good teaching can result in a faculty appointment. But you should carefully evaluate this choice as well. Consider teaching as adjunct faculty. While you may not receive medical insurance or other benefits of full-time faculty, you probably won't have to attend school and faculty meetings that don't pertain to your course. Not having to serve on committees or deal with school politics and fund-raising will free up precious time.

Teaching and practice both move in cycles. Sometimes I teach out of state as a visiting faculty member, but only when my practice is slow or my partner and key staff won't be stressed by my absence. I consider myself a full-time practitioner, but I have found that when I don't have academic duties, I miss teaching. You don't get complacent when you teach. Working with students, who find excitement in the simplest things, is invigorating.

It is possible to succeed in both areas. But you must make a difficult choice: whether to be a full-time architect and part-time teacher, or vice versa. Be aware that your part-time role, whichever it is, will often be overlooked. But the fulfillment that comes from a variety of experience is well worth the effort. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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CIRCLE 8 ON INQUIRY CARD

PULSE RECORD readers were asked: Are competitions a fair and effective way to hire architects?

No: A design competition is a great way to generate ideas for a potential client. However, I believe that the process lacks fairness and effectiveness for clients as well as architects. Clients should investigate architecture firms of interest based on previous work, and then select a firm that will fit well with the client's needs throughout the process. Architects' time, effort, and money would be saved for more viable projects.
—Robert Marshall
Cedarwood Architectural Inc.
Akron, Ohio

No: Do we ask a handful of lawyers to submit their defense strategies prior to hiring one? Competitions are a great way for owners to collect ideas, but they are extremely unfair to design professionals. An owner might even benefit financially from a submitted idea. Such ideas should not be free.
—Henry Chao, AIA
Boston

No: I think it is most fair and beneficial to owners if they hire architects based on their track record.
—Roberto B. Yumol, AIA
Honolulu

No: Unlimited architectural competitions are a legacy of the days of the gentleman architect, who didn't have to make a living from his work. An elite jury would premiate the most attention-getting entry, not always the best entry. That participants in one of these competitions should pay to enter and then give hundreds of hours of free services is a concept that no other profession would accept. In addition, the winning project is often abandoned when it does not prove buildable or functional. The winners of invited and paid competitions, however, have a better record of actually getting a project built, because the clients have a real financial commitment to it.
—Henrik Bull, FAIA
San Francisco

Yes: The spirit of competition helps to inflame the imagination of the participants. However, it is important to educate those who run competitions on the investment of energy and resources made by architects.
—Bob Cardello
Greenwich, Conn.

Yes: In most instances, a carefully organized and well-run design competition greatly enhances the probability of achieving design excellence. It is critical, however, that in the process, the interests of both the owner and the competing architects are fairly represented and protected. This would presume the identification and empowerment of an experienced professional advisor and the establishment of rules that are consistent with guidelines suggested by the AIA. If either of these are lacking, architects should run, not walk, to the nearest exit.
—Roger Schluntz, FAIA
Professor, School of Architecture
University of Miami
Coral Gables, Fla.

Yes: Competitions can be fair and effective if they are managed by an unbiased third party.
—Glenn Sweitzer
Assistant Professor of Architecture
Cornell University
Ithaca, N.Y.

This Month's Question

Can a new building that ignores principles of sustainable design be considered a success?

Architects are discovering new ways to design buildings that consume less energy. Such advances are prominent in the work of innovators like Norman Foster and Ken Yeang. In their buildings, passive devices such as double-pane glazing, naturally ventilated atria, and sun shields diminish the need for mechanical and electrical systems. In Europe, sustainability is considered a first priority of design, while in the United States it is often considered a luxury.

Can a new building that ignores principles of sustainable design be considered a success? ☐ Yes ☐ No

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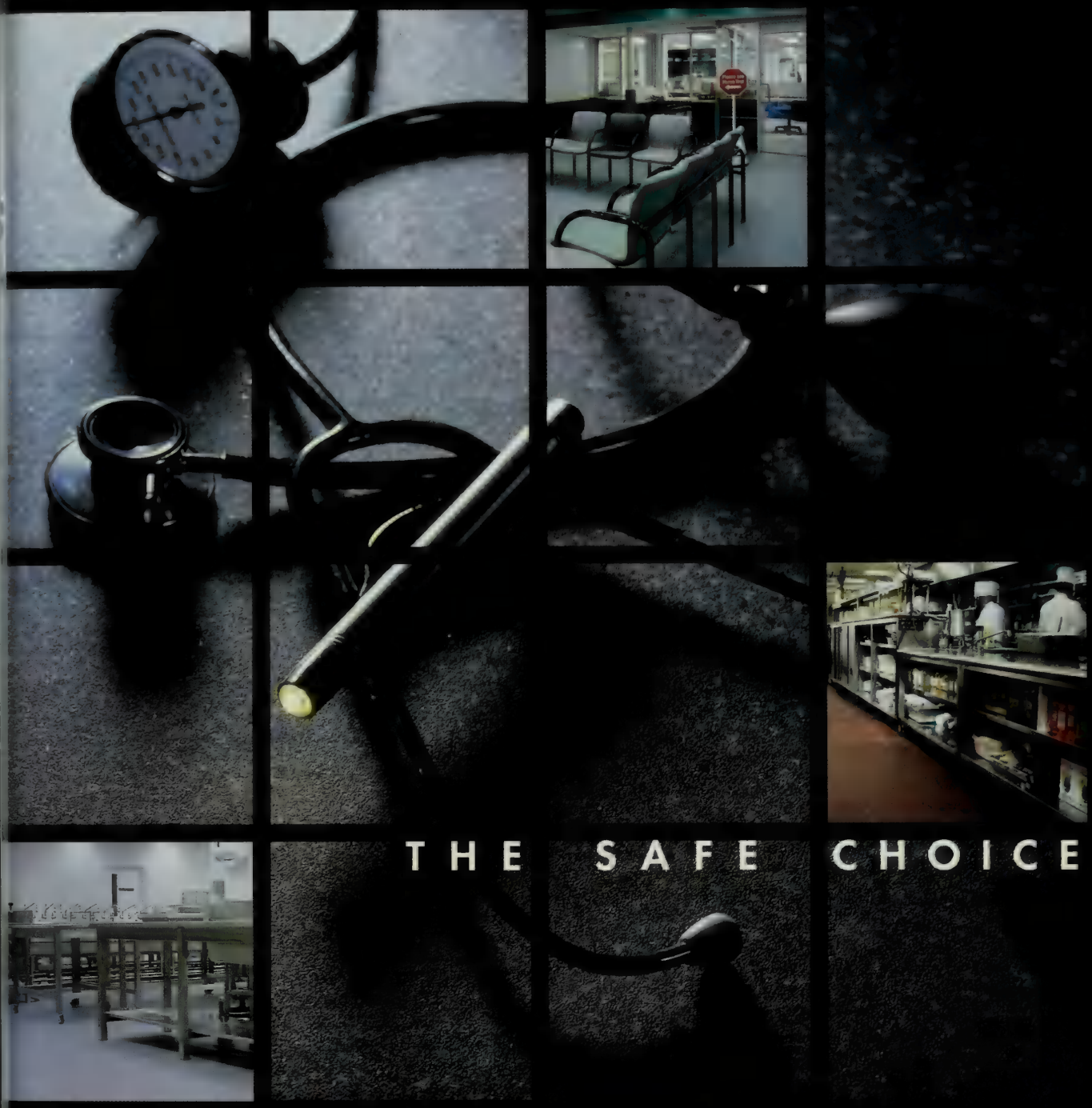
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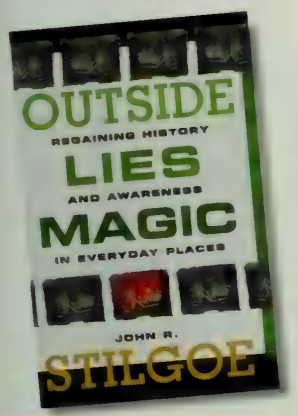
BOOKS Everyday matters: What the little things can tell us about the big picture.

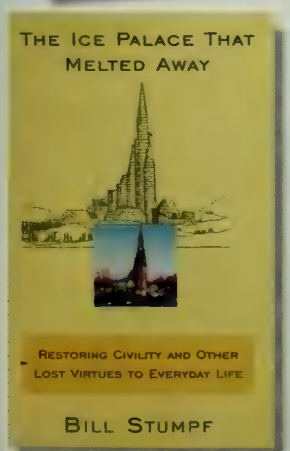
BY DAVID SIMON MORTON

Outside Lies Magic: Regaining History and Awareness in Everyday Places, by John R. Stilgoe. New York: Walker and Co., 1998, 187 pages, $21.

The Ice Palace That Melted Away: Restoring Civility and Other Lost Virtues to Everyday Life, by Bill Stumpf. New York: Pantheon Books, 1998, 192 pages, $21.

Architecture of the Everyday, edited by Steven Harris and Deborah Berke. New York: Princeton Architectural Press, 1997, 229 pages, $20.





A body of literature has emerged in the past three decades, most noticeably in the past few years, in which authors explore buildings and places termed ordinary. Compared to the numerous studies of hero designers, these works consider a much wider set of questions about how people shape their spaces. Academics are primarily responsible for this development, a group including not just architectural theorists, but historians, sociologists, and economists as well. When we also consider the recent proliferation of academic conferences devoted to the subject, it would appear that the everyday moment has arrived.

With *Outside Lies Magic: Regaining History and Awareness in Everyday Places*, landscape historian John R. Stilgoe aims to turn readers into explorers, leading them behind commercial strips, along drainage ditches, across power-line right-of-ways, and through torn chain-link fences. The book treats these margins of life, places we are used to ignoring or abhorring, as essential material for the understanding of how the apparatus of new technologies has ordered our physical environment.



Visiting these places, Stilgoe tells us their histories: how asphalt created new roadside ecosystems, how fencing in the agricultural north differed from fencing in the free-range west, how street trees in every city, town, and village were felled to accommodate the demands of fire insurance companies that power lines have clear space around them. Discussions of railroad and mail-delivery infrastructures are not meant to be complete, but rather to provide the reader with model routes of discovery.

Occasionally Stilgoe departs from neutral observation. He is bothered by electric fences, gated communities, and highway motels, as they signify the disappearance of public space and neighborly trust. Exploring offers a solution: the more we wander places that are supposedly "off-limits," the more we recover them for public use.

Bill Stumpf, author of *The Ice Palace That Melted Away: Restoring Civility and Other Lost Virtues to Everyday Life*, is an industrial designer and the creator of the Aeron and Ergon chairs. Having spent his life evaluating designs for functionality and comfort, he has found that designers, whether of buildings, utensils, parks, or processes, often forget to infuse a little of what he calls civility. Design, he writes, should encourage tolerance in place of firmness, play instead of ruthless economy, the public good over individual greed. British taxicabs, for instance—toylike, iconic, and operated by "convivial, well-mannered, street-smart urban pathfinders"—represent good, civil, design, while American taxicabs, "lurching, rattletrap affair[s] painted school bus yellow," do not.

Stumpf's standard for civility in design is the Ice Palace of the title, which was designed and built pro bono by architects, engineers, and contractors for the 1992 St. Paul Winter Carnival. The palace was an unquestionable delight to the one million people who visited it that winter. Stumpf's message to architects, that there is a strong need for their civic involvement, is delivered with humor and without undue force.

Architecture of the Everyday, edited by Yale professors and New York–based architects Steven Harris and Deborah Berke, demonstrates a more fiercely articulated political agenda in a collection of what are mostly obtuse, academic essays. Behind several of the essays is the argument that everyday or generic architecture, as lived in by most of us, resists capitalist demands to keep up with the Joneses. By limiting their discussion primarily to issues of class, the essayists—and the editors who chose them—have narrowly selected their audience.

More engaging are the book's essays about houses designed by untrained architects (whose work is mistakenly called "everyday"), floor plans of the homes of famous TV families (see Exhibitions, page 25), and presentations of artworks that show the everyday world as ordered yet isolated and frightening.

Briefly Noted

Michael Sorkin Studio: Wiggle, by Michael Sorkin. New York: The Monacelli Press, 1998, 192 pages, $35.

Michael Sorkin, the critic (once for the *Village Voice* and now as a contributing editor to ARCHITECTURAL RECORD), prefers architecture that is green, exuberant, and expressive of what he calls a tolerant community "vibe." Michael Sorkin, the architect and planner, is guided by the same creed. *Wiggle* is the Michael Sorkin Studio's first published collection of work. The projects are cheery, rainbow-hued responses to often dire urban circumstances in places like East New York, Bucharest, and Beirut.

None of the projects have been built. Like the work of Archigram, an obvious and acknowledged inspiration, the drawings are hyperdeveloped fantasy. Conceived with humor and optimism, they were designed not to solve problems realistically but rather to guide urban problem-solving along humane paths. Many of the projects are urban master plans and appear to have been formulated in respect to how they might appear framed on a



wall, not how they might appear to a hypothetical city dweller at ground level. In one design, large, rational circles interrupt a shattered urban grid—picturesque chaos. It's not a broken city, however. The urban fragments represent green public space emerging in places where most powerful interests would find it inconvenient. The vision may be impossible; the message is humanistic.



Indonesia: Design and Culture, by Clifford Pearson, with photographs by Bryan Whitney. New York: The Monacelli Press, 1998, 248 pages, $55.

ARCHITECTURAL RECORD senior editor Clifford Pearson hopped the islands of Indonesia with photographer Bryan Whitney to research an architecture and a building culture that are unfamiliar to most Western eyes. The resulting book, *Indonesia: Design and Culture,* is an enormous effort. There are 13,000 to 17,000 islands in Indonesia (depending on the tide), populated by 200 million people tethered only loosely by several hundred different languages.

The work is a thorough survey, revealing what is modern, traditional, imported, inventive, and—to us—unusual in Indonesian design. The plurality of cultures and building practices makes generalization risky. "Indonesian," after all, may only mean what the regime wants it to mean. Pearson, however, finds meaningul commonalities among the major cultures he surveys. Indonesians, he writes, are bold designers, brave enough to be open to nature, combine clashing elements, and absorb foreign influences. ■

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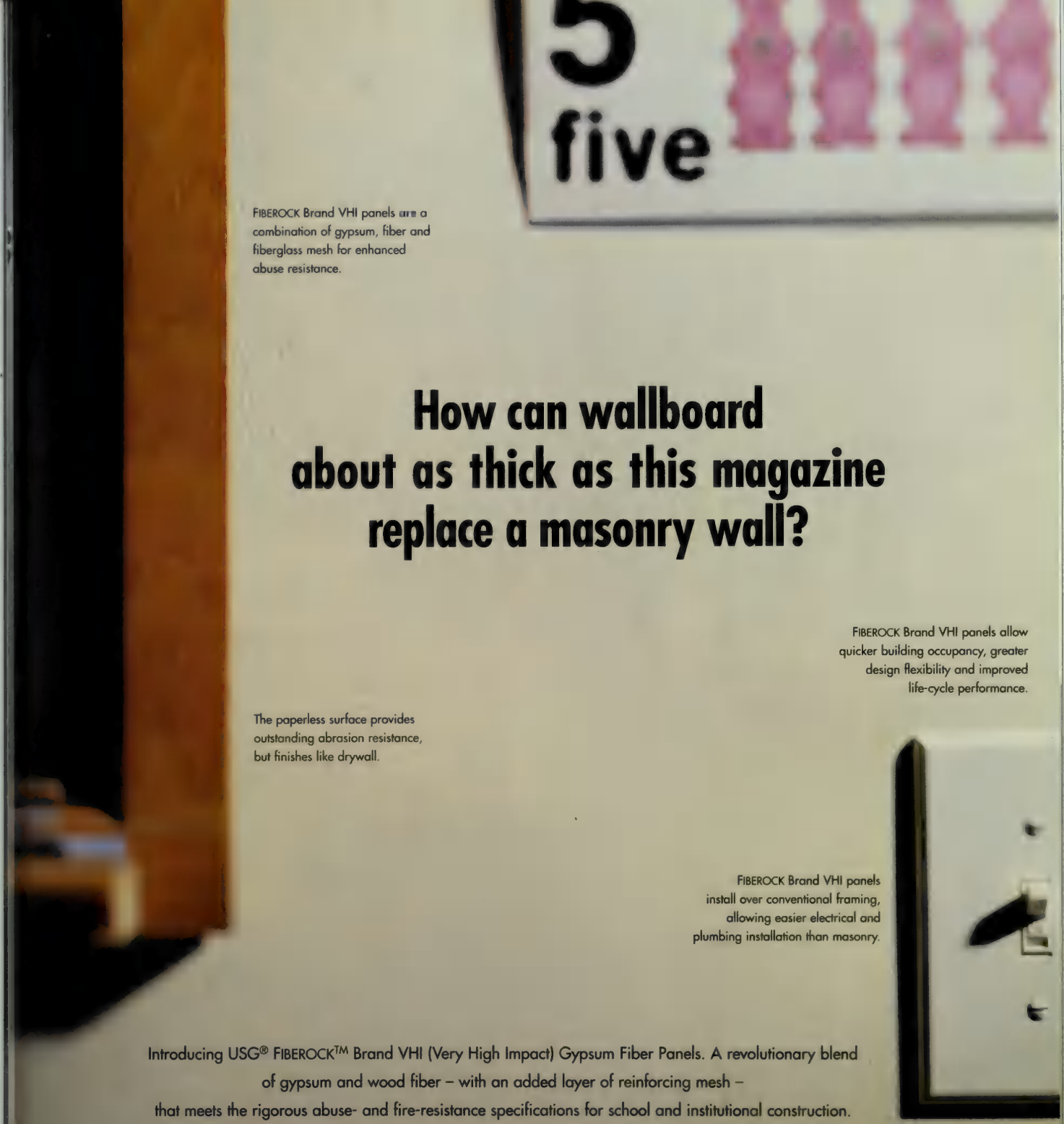
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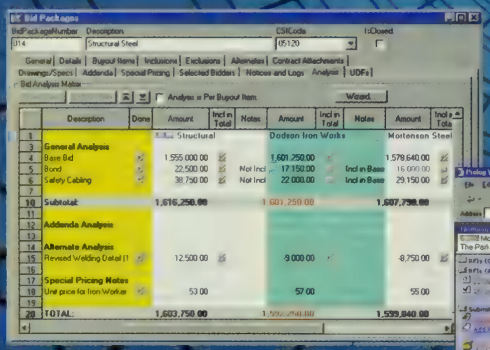
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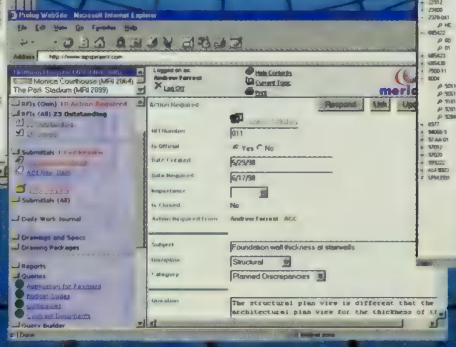
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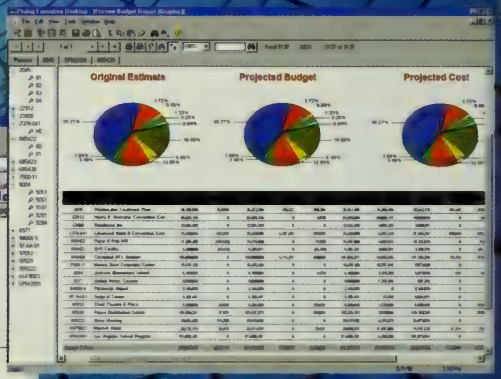
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CIRCLE 13 ON INQUIRY CARD

EXHIBITIONS Domestic arrangements: a variety of shows look at everything from sitcom houses to men and women working as design partners.

Affinities with Architecture, Belk Gallery, Western Carolina University, Cullowhee, N.C., *January 13–February 18, 1999;* Carroll Reece Museum, East Tennessee State University, Johnson City, Tenn., *March 4–April 20;* Anderson Gallery School of the Arts, Virginia Commonwealth University, Richmond, *June 4–July 25.*

Fifteen: Jim Isermann Survey, University of North Texas Art Gallery, Denton, *January 19–February 13, 1999;* Santa Monica Museum of Art, Santa Monica, Calif., *April 2–May 30;* Weatherspoon Art Gallery, University of North Carolina, Greensboro, *June 27–August 8;* Institute of Contemporary Art, Philadelphia, *September 11–October 31.*

Young Americans 2, Saatchi Gallery, London, *through November 22.*

Equal Partners: Men and Women Principals in Contemporary Architectural Practice, Smith College Museum of Art, Northampton, Mass., *through December 13.*

Affinities with Architecture; Fifteen: Jim Isermann Survey; Young Americans 2

When architects are inspired by contemporary art, the results can range from the sculpted forms of Frank Gehry's Guggenheim Museum in Bilbao to the zigzag layers of Daniel Libeskind's Jewish Museum in Berlin. A series of current exhibitions and books display the by-products of a reciprocal trend in contemporary art, as a group of young artists uses architectural devices to explore the construction of modern identity.

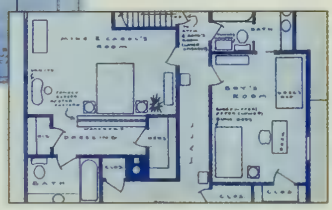
Winning widespread exposure in American and European galleries, these artists, all of whom grew up in the late 1950s and '60s, are obsessed with ordinary domestic architecture. What architects should find interesting—and disturbing—about this new aesthetic trend is the source of the fascination. Forget larger-than-life figures like Frank Lloyd Wright and Richard Meier. Popular culture—sitcom decor, thrift-shop design, and the outré glamour of Palm Springs during the era of the Rat Pack—defines this generation's idea of domesticity. Representing the coming-of-age of the Me Generation, their work is consumed with the self-conscious construction of identity in the form of mise-en-scènes.

Mark Bennett's obsessively detailed plans of the television

Donald Albrecht is an independent curator and writer in New York City.

Contributing editor David Dillon lives in Amherst, Massachusetts.





Sitcom simulacra: Mark Bennett's plans of the house from *The Brady Bunch* (left and below) reflect a fixation on television and its cultural by-products.

sitcom homes of his youth are featured in *Architecture of the Everyday*, a book edited by Steven Harris and Deborah Berke (see Books, page 22), and in "Affinities with Architecture," a traveling exhibition organized by Sam Yates, director and curator of the Ewing Gallery of Art and Architecture at the University of Tennessee, Knoxville. In "Fifteen: Jim Isermann Survey," sponsored by the Institute of Visual Arts and the University of Wisconsin, Milwaukee, Isermann revels in the visual pleasures of do-it-yourself domestic craft. Overseas, this trend surfaces in "Young Americans 2" at the Saatchi Gallery in London. In this survey of what's hot in U.S. art, Clay Ketter's art-as-building-carpentry celebrates the marriage of Mondrian and IKEA.

The artists included in these exhibitions use actual construction as a metaphor for the construction of the self. Their work is often frankly autobiographical, alluding in personal, confessional ways to their own childhoods. The objective of this new art is to fabricate self-contained fantasy worlds, using set design techniques and theatrical lighting effects. Domestic life absorbs Bennett and his colleagues, who focus on the personal over the public, manipulating familiar and ordinary images of the home to create surreal visions of the postwar suburbs in which so many of their generation were raised.

Mark Bennett works like a contemporary monk, transcribing onto paper every detail of a pop-culture televisual bible. Drawing the fictional homes of Lucy and Ricky Ricardo in *I Love Lucy* or Carol and Mike Brady in *The Brady Bunch,* Bennett fills in the architectural blanks, creating buildable homes, complete with furniture, implied by the screen's partial sets. (Bennett's day job as a postal worker in swank Beverly Hills hones his capacity to imagine houses he has never personally experienced.) The artist provides viewers with the layouts of ancillary spaces that we never see but know must be there. And attention New Urbanists: Bennett has documented that El Dorado of small-town America—Mayberry, the site of *The Andy Griffith Show.*

Without critiquing mass culture, Bennett expresses his television-



Jim Isermann's "TV Lounge" is a permanent installation at the American Museum of the Moving Image.

saturated generation's bittersweet awareness of the disparity between real life and life on TV. His work underscores a unique characteristic of television: because it comes into our homes, its simulations have the power to blur the distinction between reality and fiction. "I created the TV sitcom floor plans," Bennett has written about his art-as-autobiography, "because I love the families on television and I figured if I drew their houses or living environments, then they could become real and become my family." You *can* go home again, even if only on television.

Part arts-and-crafts devotee, part Sonny and Cher, Jim Isermann creates architectural art of psychedelic intensity. A current retrospective, curated by David Pagel, showcases Isermann's hand-loomed rugs, hand-woven fabrics, wall hangings, stained-glass windows, hooked shag paintings, and furniture in tableaux evocative of postwar suburban living rooms. Isermann's installations blur the boundaries between the hermetic art gallery and everyday life. His interiors and furnishings fuse the aesthetics of postwar abstract art with vernacular domestic forms and do-it-yourself craft techniques.

"Without exception," Pagel writes, "Isermann's streamlined hybridizations of media, styles, and sources begin with the simple demand that art increase the pleasure people take in their surroundings."

The current traveling exhibition can only suggest Isermann's flair with architectural settings, which has been demonstrated in two other installations, one in New York, the second in France. "TV Lounge" (1988), a television-centered rec room permanently installed in New York's American Museum of the Moving Image, offers visitors the chance to watch avant-garde videos and network sitcoms in a 1960s "conversation pit" with red shag carpeting, yellow linoleum flooring, and a built-in sofa and swivel chairs upholstered in black-and-white cowhide. A Victor Vasarely–like Op Art canvas of yellow and red circles is mirrored by a hand-hooked yarn hanging on an adjacent wall, showing Isermann's view of the reciprocal relationship between the fine and decorative arts.

Isermann's ability to envelop viewers in sensuous patterns peaked in his temporary 1993 remodeling of a duplex at Le Corbusier's Unité d'Habitation in Firminy-Vert, France. Like many artists of his Postmodern generation, Isermann knows the history of the visual arts, and he consciously fashions a hybrid of opposing aesthetic traditions in this installation. Decorating the interior of Le Corbusier's high-art Brutalist monument in a traditionally low-art way, Isermann covered virtually every surface in multicolored, hand-sewn fabric with matching linoleum and window curtains.

Similarly, Clay Ketter elevates carpentry and millwork into fine art at London's Saatchi Gallery. Like unfinished houses or soon-to-be-demolished buildings, there's an eerie feeling of absence in Ketter's work. His canvases range from monochromatic assemblies of drywall, gypsum, spackle, and steel trim to "traces paintings" that reveal the silhouettes of electrical outlets and wires. Ketter's wall structures recall the abstract compositions of Charles and Ray Eames's storage units for Herman Miller. But Ketter reverses the Eameses' adaptation of Mondrian-like canvases into useful furniture. Instead, he combines IKEA cabinets, melamine, and Masonite to create nonfunctional compartments.

In their fascination with vernacular architecture and design, the works of Isermann, Bennett, and Ketter are typically American. Without an elite, aristocratic tradition in the arts, American artists often look to the everyday to express the country's egalitarianism. Edward Hopper's roadside motels and urban diners house America's "lonely crowd," while Walker Evans elevates the common man with his photographs of rural churches and sharecroppers' cabins. Like Edward Ruscha, who devoted entire books to gas stations and Los Angeles apartments, however, this new generation of artists presents a more deadpan, ironic view of the vernacular. What makes them unique is their use of media not normally associated with fine art, like Bennett's architectural plans or Isermann's handcrafted furnishings.

Whereas Ketter and Isermann practice art as full-scale architectural and furniture elements, "Honey, I Shrunk the Art" might be the motto of many contemporary artists who use miniatures, dioramas, and other nontraditional media to create cinemalike worlds where scale is eerily manipulated. For these artists, reality is a construction, fabricated in a studio like a model or a photograph. In the hands of artists like Michael Askin or the more established Chris Burden, miniatures based on toy train sets suggest these baby boomers' attempts to recapture their childhood. Especially elaborate are Gregory Crewdson's color photographs of dioramas, also included in *Architecture of the Everyday*. Copying the cheap rear-projection techniques of 1950s sci-fi films, Crewdson's suburban scenes foreground three-dimensional birds, butterflies, and other animals against more two-dimensional



Gregory Crewdson's photographs of dioramas depict a suburban world where even nature is artificial.

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nightmarish vision of suburban tract housing, Crewdson's images expose the mid-movie artificiality of the postwar suburb's concept of "nature," with its manicured lawns neatly divided by white picket fences. Malevolence seems to lurk behind Crewdson's placid everyday architecture, evoking the opening of David Lynch's movie *Blue Velvet*, where hordes of vicious ants wage war in the roots of small-town lawns.

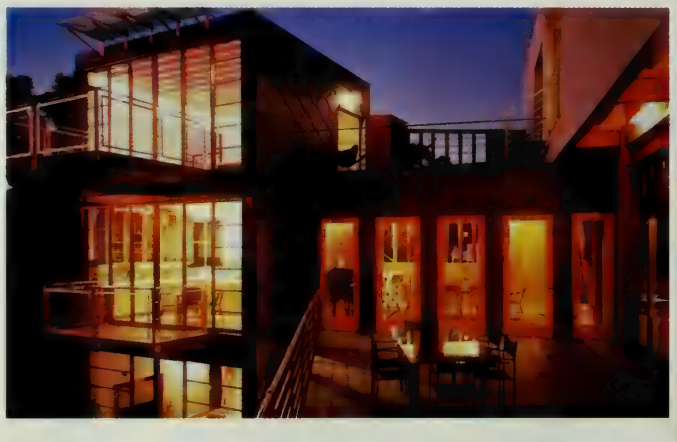
The work of model-making artists like Crewdson is radically different from that of the previous generation of artists, whose affinities with architecture tend toward the monumental and heroic. There is nothing ordinary or comfortable about Richard Serra's monumental sculptures *Torqued Ellipses*, now on view at the Geffen Contemporary in Los Angeles. Just how far the new generation has moved from Serra's sublime aesthetic can be seen in Sam Durant's series of flimsy cardboard and foam core models of the idealistic postwar Case Study Houses in Los Angeles. Riddled with holes and graffiti, the models' decrepit states metaphorically comment, according to Durant, on how the "utopian ideals of Modern design mutated into the culture of corporate ideals," losing their progressive social agenda in the process. This loss of high ambition and the acceptance of a highly personal role for art is an underlying theme in the work of this new generation of artists who sew, remodel, art direct, and miniaturize a brave new world of domesticity. *Donald Albrecht*

Equal Partners: Men and Women Principals in Contemporary Architectural Practice
Smith College's "Equal Partners" exhibition asks an intriguing question about contemporary architectural practice, only to leave the answer floating in the speculative fog. The question: whether buildings designed collaboratively by men and women are somehow different, less aggressive, more ingratiating and contextual than those designed by men alone. The answer appears to be, "Who knows?"

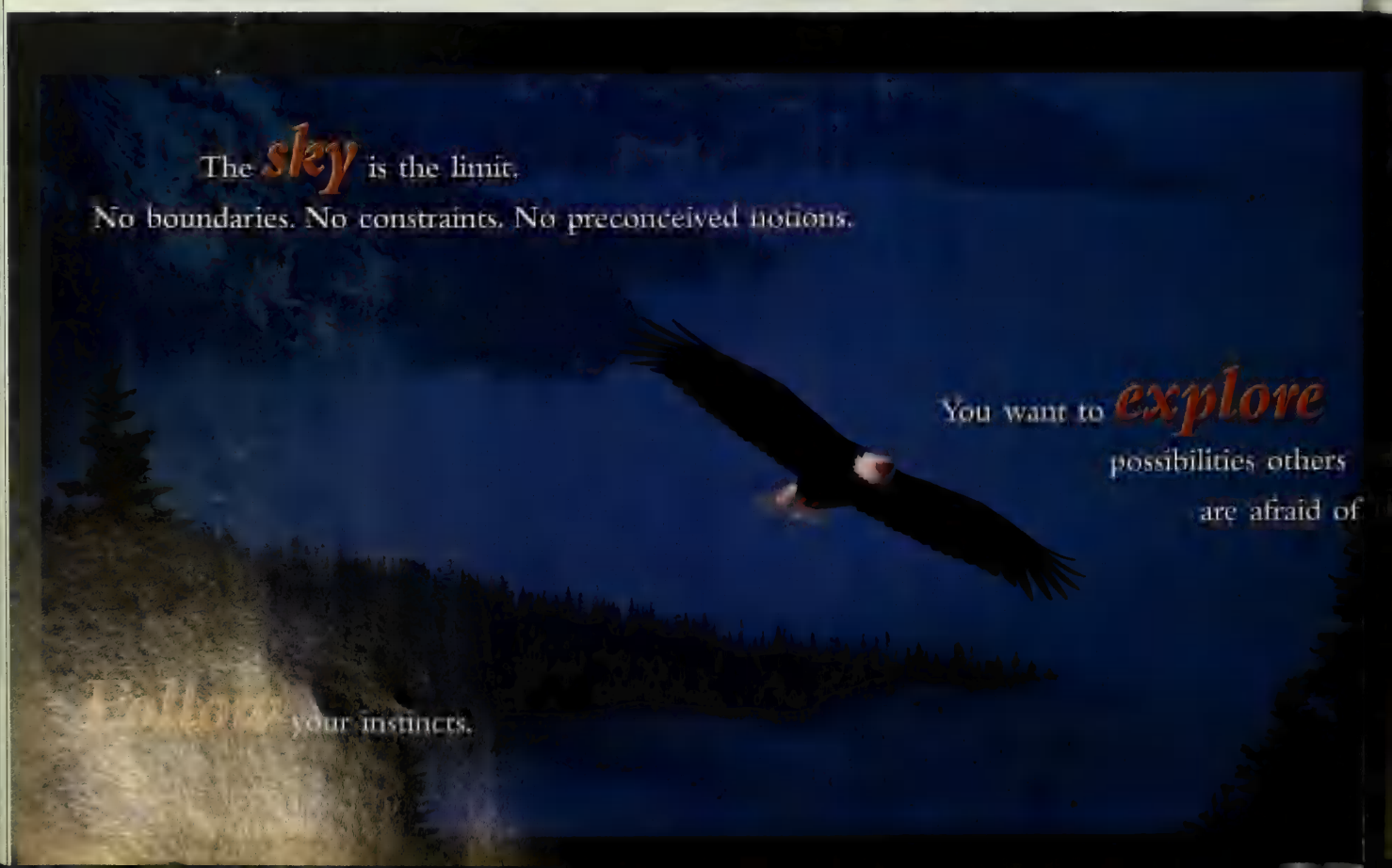
Curator Helen Searing, an architectural historian at Smith, says her intention was to celebrate women making their way in a notoriously closed profession, not to make a polemical point about gender. "I don't know that there is some essential quality to a woman's designing or a man's," she explains. "On the other hand, the work presented here seems different from that produced by macho male architects. I like to think that the buildings are friendlier and more contextual, that they don't stand out so clearly as autonomous objects."

Searing invited 15 firms that operate as male/female partnerships

The live/work "canyon house" by Cigolle X Coleman Architects.



PHOTOGRAPHY: © EDWARD PFEIFFER (LEFT)



to submit one built and one unbuilt project. She wanted some geographical distribution and some diversity in style and methodology; the only unbendable rule was that the work must be collaborative.

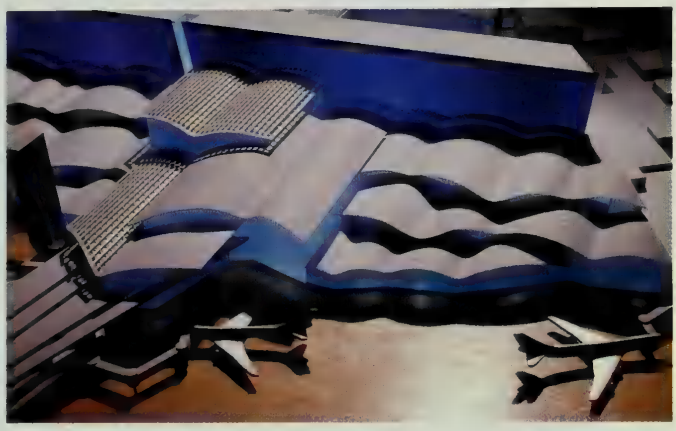
The range of the submissions is impressive: from a large government center in China by Fred Koetter and Susie Kim to a pair of small, vernacular houses in western Massachusetts by Andrus Burr and Ann McCallum. Cigolle X Coleman Architects of Santa Monica are represented by their own live/work "canyon house," while the London firm Long & Kentish submitted its stunning National Maritime Museum in Cornwall, England, which uses tidal pools and canals in its design. The exhibition features churches, theaters, and airports, storytelling projects and highly theoretical ones.

One inescapable conclusion is that women architects are no longer restricted to picking draperies and paint colors. They are now moving into the upper tier, with Smith itself having a particularly impressive list of architect alumni, including Kim, Coleman, and M. J. Long.

Beyond that, the exhibition provides an instructive overview of the various formal strategies and representational techniques in contemporary practice. In addition to conventional plans, drawings, and models, it includes computer graphics, CD-ROMs and virtual-reality presentations.

All of this is valuable information, particularly for an undergraduate contemplating an architectural career. But on the question of how—or whether—women are transforming contemporary architectural practice, "Equal Partners" is less convincing.

The best illustration is a pair of houses by Los Angeles architect Craig Hodgetts, one designed in 1982 when he was a solo practitioner, the other in 1997 in collaboration with his wife, Ming Fung. Searing describes the first as "aggressive" and "mechanistic,"



Arquitectonica's design for the Miami Airport expansion.

while the second she praises as "contextual" and "connected to the landscape."

Unfortunately, it's impossible to say even this much about the other projects in the exhibition, which reveal little about their making. In the catalogue, Tod Williams and Billie Tsien describe their studio as "a family" in which each member is responsible for his or her own work, and also for the good of the whole. But there is no hint of this rich collaboration in the exhibition text, which is mostly about materials and technology.

In the end, it is perhaps best not to focus too much on the gender issue and instead see "Equal Partners" for what it is: a provocative, handsomely presented sampler of contemporary design.

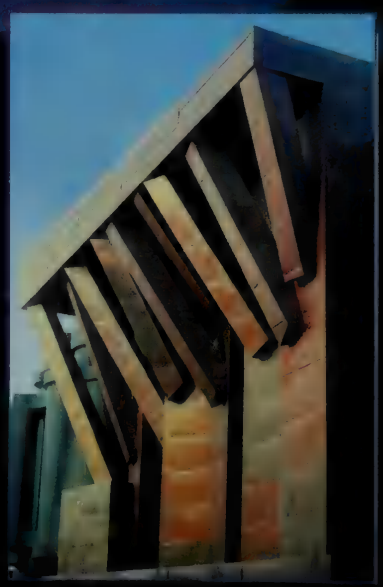
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CIRCLE 15 ON INQUIRY CARD

CORRESPONDENT'S FILE A separatist government and a raw, industrial aesthetic have been shaping the new look of Montreal.

BY BETH KAPUSTA

Beth Kapusta, who graduated from the University of Waterloo School of Architecture in 1991, is working on a book about the National Archives of Canada. She lives in Toronto.

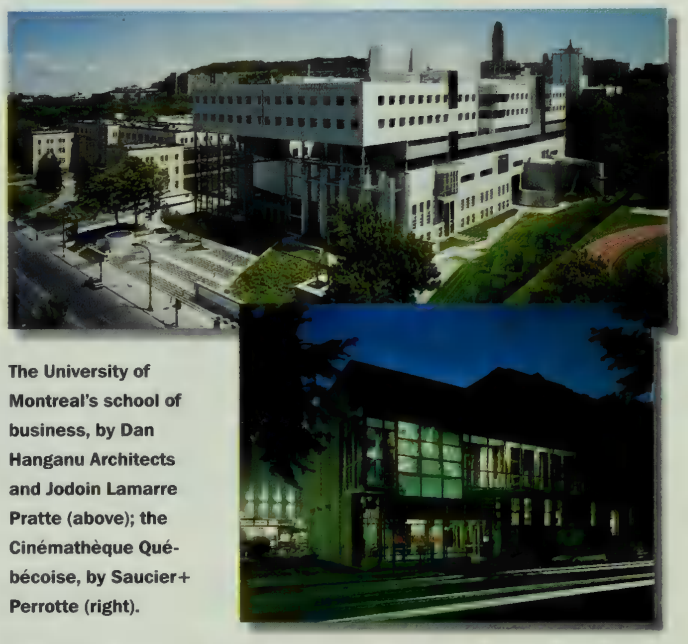
Montreal's historic architecture is perhaps the most European of all North American cities, an urbane amalgam of French, English, and other immigrant influences.

One might expect to see the same leading-edge, cosmopolitan influences in contemporary work. However, there is a curious lack of sophistication here, especially in terms of tectonics, though this is somewhat offset by an overarching focus on the public character of recent buildings.

This island-city seems fated to experience both the best and the worst of visionary planning and architecture, from the white elephant 1976 Olympic Stadium, a dysfunctional and deteriorating facility that taxpayers are still paying off, to the 1967 Expo site, now reoccupied with symbols of a new era: the skeletal Buckminster Fuller dome serves as the podium for an environmental interpretation center, while the French Pavilion houses a popular casino.

Montreal's greatest planning triumph is also its oldest: the Frederic Law Olmsted–designed park on the mountain that is the psychological heart of the city, a 550-acre masterpiece of picturesque planning surmounted by a neon-trimmed cross.

As apparently seamless as the marriage of symbols may be—the cross of French Canadian Catholicism watching over the second-generation English landscape—a war of words between the cultures continues to rage. Many of Montreal's architects claim to be apolitical in response to the divisive debate over the future of Quebec as a Canadian province, but with another election looming, uncertainty still reigns.



The University of Montreal's school of business, by Dan Hanganu Architects and Jodoin Lamarre Pratte (above); the Cinémathèque Québécoise, by Saucier+ Perrotte (right).

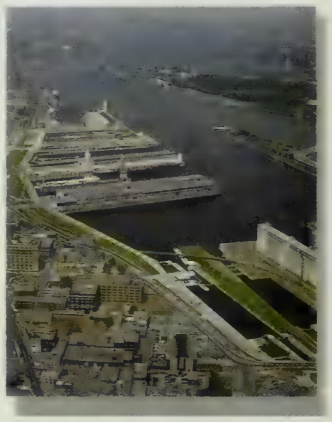
Even though architects haven't done badly over the past decade, enjoying work from a program that resembles a mini-*grand projet* initiative in the French tradition, there is an undercurrent of anxiety that political divisiveness is wearing the city down. While the incumbent separatist government has been preoccupied with weaving a cultural mythology, it has little concern for the day-to-day upkeep of the projects it has funded.

Some cultural facilities originally financed in this propagandist spirit are in a sorry state of disrepair because of a lack of ongoing maintenance. In addition, much of the provincially funded construction of the last four years has concentrated on Quebec City, seat of provincial politics, rather than Montreal, where a decisive majority voted against sovereignty in the last referendum.

Recent architecture mirrors the restlessness of Montreal's political spirit. While Toronto's architecture is a refined but extremely conservative neo-Modernism and Vancouver's regional bias is toward rustic tectonics of exposed (mostly wood) structure and lots of glass, Montreal is marked by the use of off-the-shelf materials, assembled with an unmistakable rawness.

It is a city whose architecture is surprisingly indifferent to the craft of building, a deliberately anticorporate sensibility that seems to be a sustained response to the conservative structures that characterized Montreal until Toronto supplanted it

industrial aesthetic. Like the work of many other local practitioners—Atelier Big City, Jacques Rousseau, Saia et Barbarese—InSitu's designs have a tough, graphic quality.





The Old Port park by Cardinal Hardy (left); Luc Laporte's Via Roma (right).

Formerly the home of a marine outfitter, the industrial building was scoured out to create offices for a movie software business and a multimedia production company. The design strategy is more reductive than additive, with several large spaces carved from the existing floor plates. The detailing on new elements has the feel of a sort of welding-torch Modernism. The found spaces are raw and powerful, although aesthetic novelty tends to get the better of function and pragmatic detail.

A heavy emphasis on public amenity characterizes the Ecole des Hautes Etudes Commerciales de Montréal (H.E.C.), the school of business at the University of Montreal, by Dan Hanganu Architects and Jodoin Lamarre Pratte & Associates. At best, the Hanganu-led team has the ability to create buildings that are microcosms of slightly disheveled, chaotic, and animated cities. At the tectonic level, the work is preoccupied with using inexpensive materials, often in incongruously expensive ways. In the business school, for example, there is remarkably little standardization of technique, making what seems to be an off-the-shelf building quite expensive to build (about $150 per square foot).

An oversized, five-story portico that marks the business school's entry is an extremely overt indicator of arrival. The strength of this building lies within, with its complex sectional collage. On the main floor, a sinuous glass inflection in the east wall preserves a stand of trees. The interior winter garden, a powerful visual focus, serves as the main

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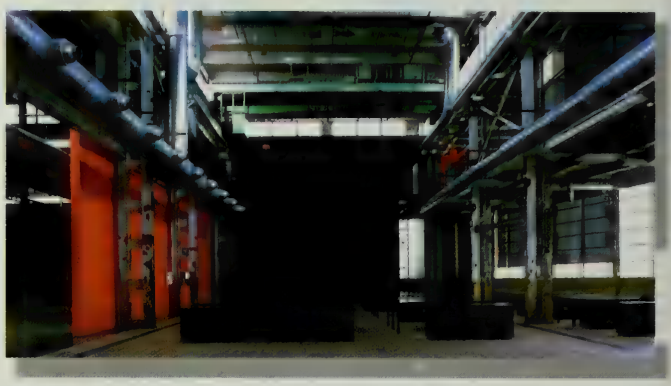
integral glass space for the mas sive, nearly 500,000 square-foot building.

Next door to H.E.C. sits the recently completed University of Montreal School of Architecture, by one of Montreal's most talented firms, Saucier + Perrotte Architectes (with Menkès Shooner Dagenais as associate designers). Like many of the most successful architects in Montreal, Saucier + Perrotte has made its mark by being diplomatic negotiators with history. The problem of expanding the school of design from its rather penitential vessel in an old nunnery has been handled with elegance, rigor, and compositional dexterity.

A grand lobby, featuring a huge screen showing the slides appearing in the 450-seat auditorium whose back wall protrudes into the space, is a grandiose move. The studio areas are less thoroughly designed, although a Bauhaus-like louvered glass wall on the north elevation creates an intriguing, almost digital display of goings-on within. The palette, shades of gray, is a little cool, but it is mediated by a careful modulation of light via a transparent courtyard.

The most interesting project to date by Saucier + Perrotte, probably the least "industrial" of contemporary Montreal practitioners, is the Cinémathèque Québécoise, whose salient feature is a backlit frosted glass wall that animates the street with moving images projected from within. The firm's preoccupation with the cinematic effects of architecture is well suited to this program, as themes of voyeurism and architectural promenade are skillfully overlaid as montage on the structure of an old school.

To better understand the principles of Montreal's unique sensibility, it's good to look at the work of a lesser-known architect, Luc Laporte, whose designs, though mostly small-scale, are some of the city's most cosmopolitan. Like Saucier + Perrotte's work, Laporte's



In Situ's "Zone," an industrial building converted to offices.

is highly expressive and carefully directed, and it has a spirited sense of the social quality of the city. His latest project is Via Roma, a trattoria that addresses one big idea: how to make a commodious outdoor dining terrace in one of the coldest cities in North America. This is accomplished by means of two retractable greenhouse roofs supported above a large, simple room, which is radiant-heated through the floor and has lush grapevines growing up the walls. It is an economical gesture, devoid of unnecessary embellishment, though it lacks finesse on the detail level.

In its contemporary architecture as in its politics, Montreal continues to feel the conflicting forces of parochialism and cosmopolitanism. Broadening the architectural dialogue and coming to terms with the technique and craft of building will be important factors in realizing the city's rich architectural potential. ■



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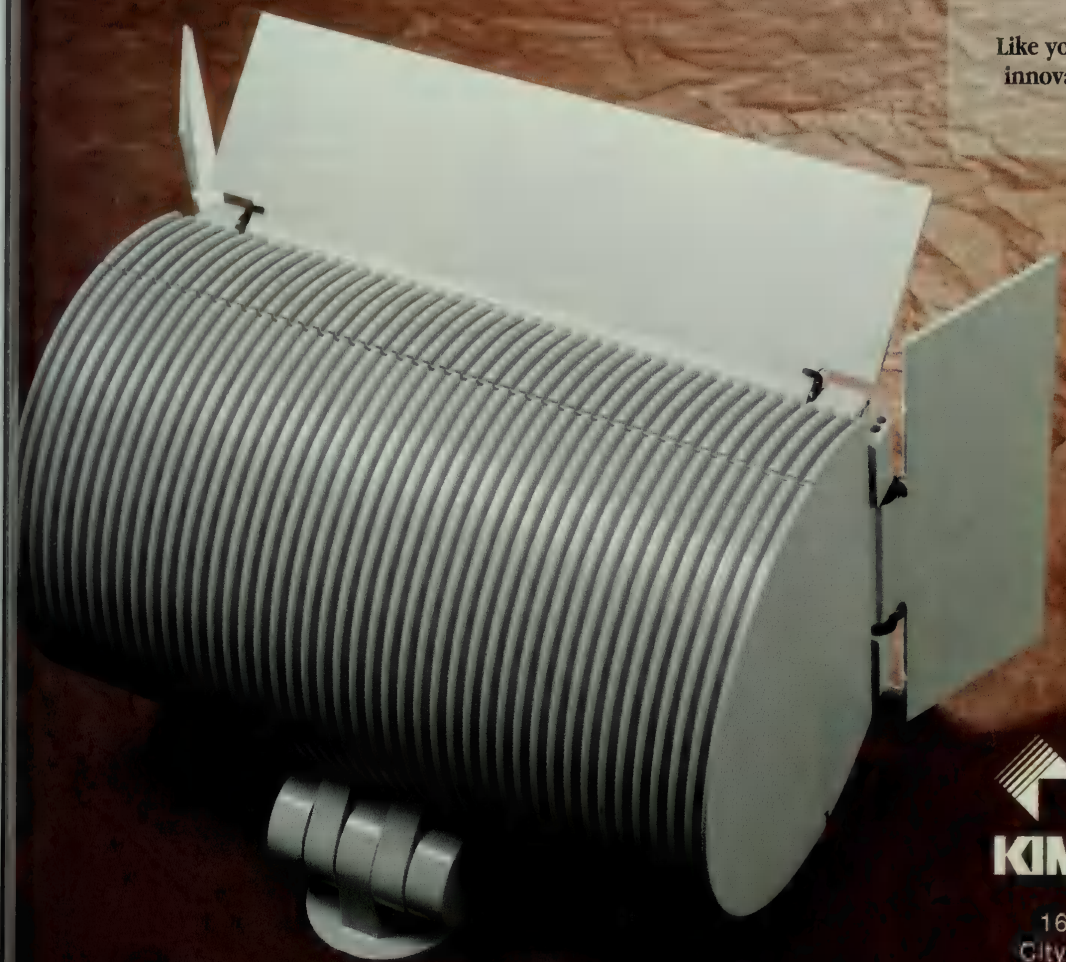
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CYBERSPACE REPLACES CLASSROOMS IN INTERNET ARCHITECTURE SCHOOL

Architecture education will take a bold leap into cyberspace in January when the newGraduate School of Architecture opens its virtual doors. The program, which can be found at www.newgraduate.org, will offer holders of accredited architecture degrees—from either a five-year bachelor's program or a master's program—a way to earn advanced degrees via computer.

NewGraduate students can earn nonprofessional Master of Architecture degrees in three areas that are considered important to practice but are seldom stressed in traditional education: business and practice management, information systems technologies, and environmental design.

Tuition for a 30-credit master's degree will average about $4,400. Students can expect to spend about eight hours a week on their studies in order to earn a degree in 15 months, says the school's dean and cofounder, David Mackey, an associate professor of architecture at Ball State University in Muncie, Indiana, which has no ties to the new school. Students can also choose to take courses to earn AIA Continuing Education credits.

Mackey expects to attract recent architecture school alumni and mid-career architects looking for ways to squeeze continuing education into harried home and working lives. As one soon-to-be-newGraduate student put it in an E-mail: "I have been practicing architecture for 15 years and manage a seven-person firm. You just gave me a way to reach my goal of an M. Arch. degree without sending seven other people to the unemployment line."

Mackey and the school's other cofounder, Theodore C. Alex, director of the MBA program at the University of Findlay, in Findlay, Ohio, are hoping to enroll at least 80 students in 1999, with a goal of 240 in three years.

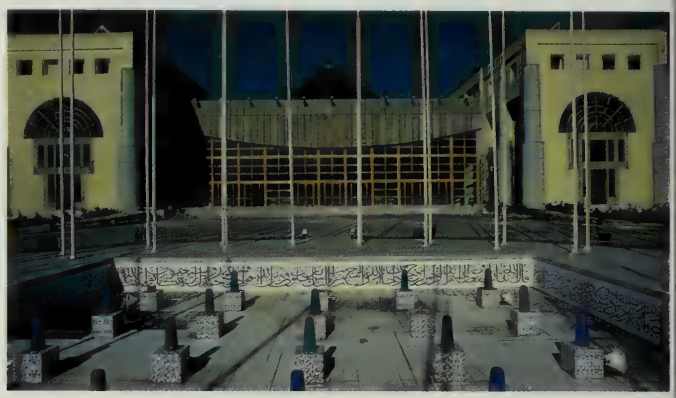
College-level distance learning using the World Wide Web has been spreading since schools like the University of Phoenix pioneered the idea on a large scale two years ago. More recently, other major, traditional schools like New York University have begun vying for a share of the online learning market.

Architecture education has been, until now, a scarce presence on the Internet. There are schools where students share projects over the Internet, or where individual courses have been put out on Web sites, says Martin Moeller, recently departed executive director of the Association of Collegiate Schools of Architecture (ACSA).

The ACSA has greeted the new program cautiously. NewGraduate won initial accreditation status with the Indiana Commission on Proprietary Education, permitting it to accept student applications. Still, the ACSA's board rejected Mackey's first bid for affiliate membership last June, opting instead to form a task force to study, among other things, how a school on the Internet might conform to existing rules and standards.

Among the early concerns is whether traditional architecture schools will honor newGraduate degrees for those wanting to gain teaching positions. Another worry is the quality of the faculty. A few, like Mackey, E. Fuller Moore of Miami University of Ohio, and Kenneth W. Schaar of Louisiana Tech, are veterans. Many others are junior faculty at architecture schools, attracted to newGraduate by the creative freedom and the prospect of royalties.

"NewGraduate is the first out of the box," says R. Wayne Drummond, president of ACSA. "We want to set the bars in the right place in this brave new world." *Lee D. Mitgang*



DESIGNING IN THE HOMELAND: AN AMERICAN GOES BACK TO IRAN

In June 1997, the government of Iran called Iranian-born Yahya Fiuzi, AIA, at his home in the suburbs of Washington, D.C., and asked him to design and lead construction of a huge convention center in Teheran. The new building would shelter the triannual summit of Islamic nations, to be held that December.

There are few architects, if any, in Iran with the requisite expertise for such a project. Fiuzi's concern was whether he could hire non-Iranian contractors; he was told he could. Two days after getting the go-ahead, Fiuzi was meeting his new clients in Teheran.

Upon arrival, however, Fiuzi was asked to use local contractors. He adjusted: in the first 15 days Fiuzi selected a site and a primary contractor and hired a design staff of 140. "I didn't hire architects older than 26," he says. "The young generation are like hungry tigers waiting to show their ability to the international community." Fiuzi's design team produced 4,800 drawings over the next several months, including designs for fabrics and furniture. Several alternatives were rendered to account for the limitations of available technologies.

In the completed International Conference Center, much of the 250,000 square feet is given over to an 1,800-seat central assembly hall. A steel-framed, stainless-steel-paneled dome—a 130-foot-diameter cone centered off-axis—peaks 100 feet above the floor. The panels were punched with holes and fitted with 40,000 glass cylinders to channel daylight inside.

With 6,000 workers laboring around the clock, the project was finished on time. The government was satisfied, having spent $30 million, with only 7 percent of that in foreign currency. And Fiuzi was offered a dozen new commissions. "I'm staying because the country needs me, but also because some ideas take shape better here," he says. While admitting there are clear limitations to working in Iran, Fiuzi says that "in the United States every project is affected badly by developers and the like. I feel freedom here." *David Simon Morton*



The main facade of the 250,000-square-foot International Conference Center in Teheran (above). Local laborers work on the dome, whose panels were fitted with 40,000 glass cylinders (left).

ARCHITECTS AND ARTISTS TEAM UP FOR CALIFORNIA'S VILLA MONTALVO

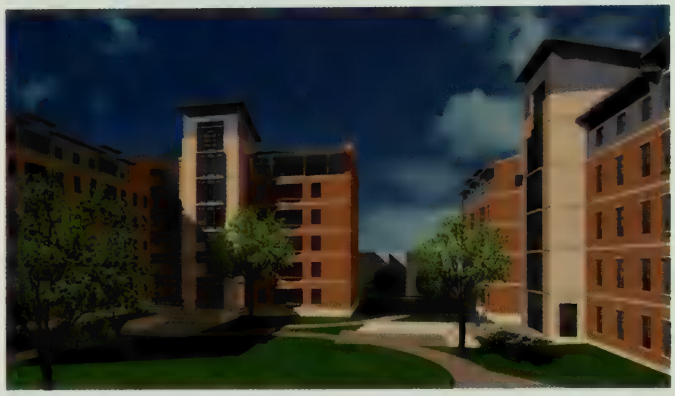
Since 1912, Villa Montalvo has been an active arts center in Northern California; since 1942, it has had an artist-in-residency program. The Villa Montalvo Foundation recently invited five architects to collaborate with the artist of their choice to design a new complex of live/work spaces (one pair per design team) for the artists who populate the 175-acre site in the foothills above Silicon Valley.

Portland-based architect Donald J. Stastny, coordinator of the project, designed a commons building incorporating a large gallery and a library/office. His is the only scheme to evoke the palette and Mediterranean style of the original villa, which is listed on the National Register of Historic Places.

All the other schemes exhibit a range of design, construction, and materials, along with a range of muses. Jim Jennings, who teamed with artist Richard Serra and poet Czeslaw Milosz, saw in Milosz's poetry "an articulation of clearly defined volumes and spatial experience," which he translated into a solid-walled rectangle cut into a slope. Jennings's other rectangular structure, inspired by "both the lightness and heaviness" of Serra's sculpture, is of concrete block and translucent sheathing. The plan is one-quarter solid living cube and one-quarter open courtyard cube, balanced by two translucent studio cubes.

Each 700- to 900-square-foot cottage was conceived for the execution of a specific art form, such as writing or performance art. "The contradictory requirements of a hermetic retreat and the need for community," as participating architect Dan Solomon puts it, was a programmatic concern as well.

The buildings, joined by a pathway and set in five acres of orchard, will complement the existing site's redwood groves, extensive formal gardens, miles of nature trails, and an Audubon Society bird sanctuary. Construction will begin next July and be completed by the summer of 2000. *Terry Bissell*



ST. JOHN'S AIMS BEYOND COMMUTERS WITH FIRST ON-CAMPUS RESIDENCES

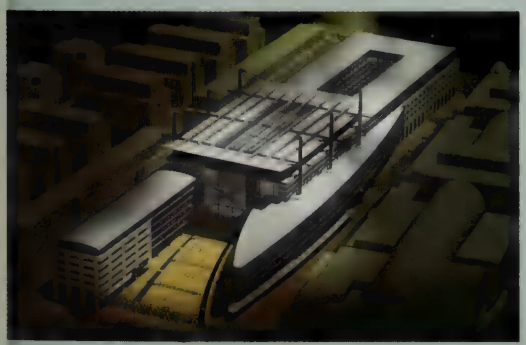
"Build it, and they will come," is the philosophy behind St. John's University's first on-campus student residence halls, to be completed by the fall semester of 1999. The university's urban campus in the New York City borough of Queens has never had a strong dorm-based social life, catering mainly to commuting students who don't have to stay overnight. Now St. John's wants to encourage students outside commuting distance to enroll, and it has hired the New York architecture/design firm Einhorn Yaffee Prescott (EYP) to complete phase one of a $300 million project to house and feed students near where they go to class.

EYP's marching orders are to design three residence halls, holding some 700 students, and a separate dining facility with seating for 430 on the Queens campus. "The design concept is a village of buildings separate from the academic buildings," says Ron Whatley, an EYP partner and principal-in-charge of the project. Since it's an urban campus, he says, EYP wanted "a village that fits in with the surrounding landscape, yet still feels like residences."

The dining hall will be only two stories high, while the residence halls (above) that surround it will be five or six stories and total 250,000 square feet. Each residence floor will consist of at least six suites, and each floor will also include a common area, study, and lounge; EYP has used bay windows to break up the scale in these areas so they don't appear too academic. For the facades, EYP is using a salmon-colored brick alternating with stonework, to harmonize with the campus's dominant materials.

The dining hall and assembly facility will also include a fitness center and a "cyber lounge." The overall goal: use architecture to create a self-contained, inviting social environment, something the university has been short on. The project will also set the tone for future on-campus housing. *Rachael Butler*

LOHAN'S SWEDISH ADVENTURE **Chicago's Lohan Associates, whose current projects include an office building in Prague and a Grand Hyatt in São Paolo, has won a competition to design Vastra City, an 877,300-square-foot mixed-use development in Stockholm. Initiated by the city of Stockholm and the Swedish State Railway (SJ), the project will occupy the space over a section of railyard located near the city's historic and business districts. Plans include a 450-room hotel and a congress hall capable of seating 4,000, as well as retail, office, and residential space. The city and SJ are currently seeking investors; construction should be completed around 2003.**



Although the site is not far from the 16th-century Klara Kyrka church, many of the adjacent buildings, such as the World Trade Center, were erected in the past 30 years. Municipal authorities requested that the design respect the surrounding building heights but they made no other style specifications. "[City officials] were concerned about how it fits into the urban context, yet they very much didn't want us to replicate what's around it," notes Lohan principal Floyd Anderson. "They wanted a bold aesthetic statement."

Working with a Swedish partner, Thurfjellgruppen, Lohan designed a rectilinear mass with two projecting wings, one a glass-sheathed ellipsis. In a gesture both structural and symbolic of the context, the central portion of the building is topped with a mastlike rigging that supports the roof of the congress center and provides the building with a distinctive presence on the skyline. An extensive plaza between the two wings acts as an antidote to the massiveness the program demanded; in addition, the architects suggested bisecting the existing World Trade Center (at left in photo) to create a vista of the nearby waterway. ***Thomas Connors***

FOREIGN PRESS ROUNDUP

DUTCH TREATS

In the first of two issues of *Architecture + Urbanism* (Tokyo) devoted to the Netherlands, writer Peter Buchanan describes the Dutch government's extremely generous efforts to promote and develop architects and contemporary architecture. The government subsidizes the publication of architectural books and journals, the Netherlands Institute of Architecture in Rotterdam, and even foreign travel for architects. Because of such official support, the country is the easiest place for a young architect to start a career, according to Buchanan. In another unusual situation, private clients vie with government agencies to discover new talent as proof of architectural connoisseurship.

SITE CONCERNS

French firm Art'M recently completed its first big job, a junior high school for one of Marseilles's less cheerful neighborhoods. In the September issue of *L'Architecture d'aujourd'hui* (Paris), Art'M principal Matthieu Poitevin writes frankly about the building's fate. "In spite of their reputation as combat zones, these places have a definite identity of their own and the violence is formalized. . . . The school is broken into every other weekend [including 'bunker-rooms' designed to be especially secure] and burnt-out hulks of cars regularly appear beyond the sports grounds. But this is nothing out of the ordinary. You could almost say that it's normal."

HISTORY ON ICE

The latest issue of *Arkkitehti* (Helsinki) celebrates the 250th anniversary of the building of Soumenlinna, a small group of fortressed islands near the docks of Helsinki. The Finnish government has recently abandoned its attempt to vitalize the archipelago with full-time residents and move the islands into the stream of everyday Helsinki life. Twenty-five years after the military ceded the islands to civilian authorities, 870 people live there, far short of the goal of 2,000. Further funding will concentrate on the renovation of the historic military facilities and their conversion to tourist-grade public spaces, such as theaters and museums.

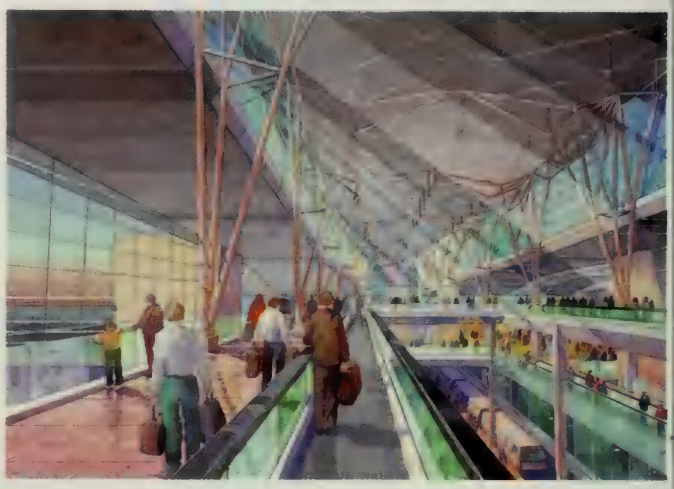
URBAN VALUES ENDANGERED

Sarona is a century-old Tel Aviv neighborhood of 70 small homes and relatively lush greenery—dominated by a long-present military base. *Architecture of Israel* (Tel Aviv) editor in chief Ami Ran writes, "Thanks to the base, not only are the city streets filled with easy-going soldiers, but a very gentle and civilized piece of urban fabric has endured." However, commercial developers recently purchased much of Sarona's real estate, and the bulldozing has commenced. Ran suggests that the city engineer, who told Ran he was too occupied by the coming elections to interfere with the destruction, is a political crony who should be replaced.

SLOW LEARNERS

As reported in the October issue of *Blueprint* (London), British architect Kathryn Findlay has been named associate professor at the University of Tokyo's architecture program, the first woman to hold such a position at the university. She is also the first foreign-born professor to be appointed this century.

—compiled by David Simon Morton



SALT LAKE CITY AIRPORT WILL FLY IN A NEW PATTERN

A new kind of airport design is preparing to take flight in Utah. Conceived by a joint Gensler/HNTB team, the Salt Lake City International Airport Authority will usher in the new millennium with a building that it hopes will be efficient and dynamic. It will be built in two phases over 15 years.

The building departs from typical airport layouts, which utilize fingerlike piers extending from a central hub. The organizing element of the new SLC airport is a linear spine that runs perpendicular to the terminal and roadway system. The spine is actually an extension of an existing light-rail line, which itself is tightly woven into the city's grid and terminates inside the airport's parking structure. The spine will connect parking with the terminal and main concourse, and includes a station for an underground moving walkway to ferry travelers to the remote concourse.

The building forms rise up along this line, emerging organically from the landscape. The multilevel spine separates outbound and inbound traffic, so travelers on each level all move in the same direction. The axiality of the building serves as a means of orientation and is important to the notion of "intuitive wayfinding" that the designers say they have explored extensively. That idea is further reinforced by the careful attention to daylight, which is present everywhere in the building and draws people forward and toward specific destinations.

The building's skin is highly transparent to take advantage of the spectacular views of the surrounding mountains.

The design team has come to know Salt Lake City and its inhabitants well, resulting in a building that responds to its context. To express the community's rootedness and connection to the environment and landscape, as well as its role as a leader in technology research and development, the airport is a mix of heavy materials at the base and lighter, transparent materials above.

The base is richly colored in rusts, purples, reds, greens, and golds, reflecting Salt Lake City's unique geography and culture. Out of it rises a glass skin and expressive steel structure and roof volumes.

If the architects' experimental spine design functions as intended, the resulting clarity of movement and spatial richness, coupled with the drama of the surrounding landscape and the tectonic boldness of the structure, could make the airport experience a pleasant and dynamic one for the millions of travelers who will pass through each year. *Alice Y. Kimm*

MIXED NEWS FOR BUILDINGS PROGRAMS IN LATEST FEDERAL BUDGET

Under the fiscal 1999 appropriations approved by Congress in October, some federal buildings programs saw increases, but other major players were cut. Winners included the General Services Administration (GSA), the National Institutes of Health (NIH), and the Department of Housing and Urban Development (HUD). But funds for building programs at the Department of Veterans Affairs (VA) and the Federal Bureau of Prisons were decreased.

Jim Dinegar, the AIA's vice president for government and industry affairs, says, "We think this is the start of some good money flow for public buildings construction."

The GSA is receiving $492 million for new building, after getting nothing for new construction this year. "I don't think it's going to alleviate the backlog, but it's going to help us go forward," says John Sporidis, senior vice president with HDR Architecture Inc., a firm based in Omaha, Nebraska, that designs many federally funded projects. The GSA will also get $668 million for repairs and alterations, more than double last year's $300 million.

The GSA's main business remains courthouses: 14 federal court projects account for $462 million of the agency's new construction budget, including design money for projects in Biloxi-Gulfport, Mississippi; Eugene, Oregon; Springfield, Massachusetts; Little Rock, Arkansas; and Cape Girardeau, Missouri.

At HUD, the HOPE VI program, which finances demolition of older high-rise public housing projects and construction or renovation of lower-rise replacement units, got a 14 percent boost, to $625 million. Other urban building projects are financed through HUD's 24-year-old Community Development Block Grant program, whose spending rises 7 percent, to $5 billion, including $200 million for disaster relief.

Receiving less funding are agencies like the VA, whose major construction program slipped 20 percent, to $142 million, and the Department of Defense, where construction money for military family housing plunged 20 percent, to $712 million, and other military construction declined 3 percent, to $3.1 billion.

HDR's Sporidis says budgets for law enforcement and medical research agencies will continue to be healthy. The NIH, which has some $850 million in construction planned or under way, will get $238 million, up 15 percent. At the Bureau of Prisons, which has turned to design-build for new projects, facilities spending will be down 26 percent, to $411 million. But Congress did instruct the bureau to seek an extra $300 million in fiscal 2000 for modernization and repair.

In the State Department's budget, lawmakers approved funds to design two U.S. embassies: $10 million for Berlin and $15 million for Beijing. The department is also getting $627 million for security improvements at overseas posts, prompted by bombings in August at embassies in Dar es Salaam and Nairobi. Of that amount, $163.5 million will go to clean up the sites of the damaged embassies, acquiring new sites, and design-build contracts for replacements.

Architects were disappointed that Congress rejected President Clinton's plan to stimulate school construction by buying down interest rates on bonds that local school districts issue. In addition, Dinegar says the big Capitol Hill news for architects this year was the Transportation Equity Act for the 21st Century. Funds for urban planning and for designing rail stations and other projects in which architects play a sizable role make up a relatively small part of the bill's $217 billion total authorization. But, Dinegar says, "The total amount is so big people fail to realize how many dollars are there for design." *Tom Ichniowski*



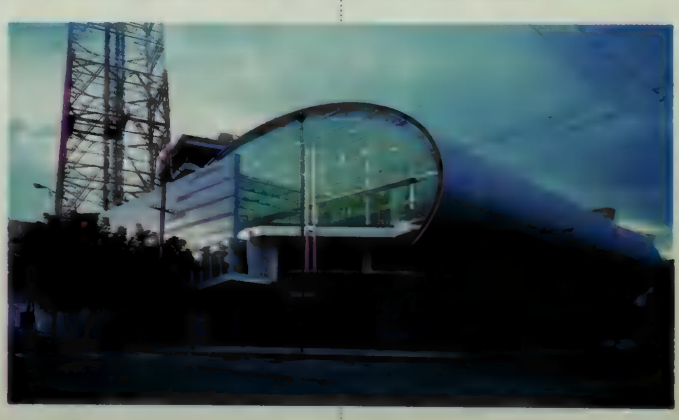
LOST AND FOUND **The New York firm LOT/EK, run by two young Italian-born architects, Ada Tolla and Giuseppe Lignano, has been making use of industrial leftovers in its various designs. The duo's latest work involved cutting a petroleum trailer tank into slices and installing rubber tubing and televisions, creating individual viewing capsules. "TV/Tank" will be at New York's Deitch Projects through January 2.** ***Soren Larson***

LATIN AMERICAN EDITION OF MIES PRIZE GOES TO MEXICAN ARCHITECTS

The first Latin American Mies van der Rohe Prize, established by the Barcelona Foundation as a biannual award to complement its well-known European honors program, has been awarded to the Televisa Services Building, designed by Enrique Norten and Bernardo Gómez-Pimienta of Mexico City–based TEN Arquitectos. With the award, a miniature replica of Mies's Barcelona Pavilion, comes a 50,000 ECU ($55,000) purse.

TEN Arquitectos, founded in 1987, has sought to bring some of the rationalizing qualities of the global avant garde to a country with chaotic urban conditions and conservative tastes. The firm's winning building, completed in 1995 on a difficult wedge of Mexico City land for Mexico's largest television network, houses a parking garage and offices in a polished black concrete plinth, and contains a dining area in a vaulted, aluminum-paneled shell above.

Juror Ignasi de Solá-Morales said the design won for the clarity of its urban placement, the adjusted hierarchy of its interior spaces, and the lightness of its forms. It was selected over projects by Oscar Niemeyer, Teodoro González de León, and Ricardo Legorreta, among others. *Miquel Adrià*



A STUDY IN LONGEVITY: RAMBUSCH CELEBRATES 100 YEARS

Of all the decorative arts workshops in business in the United States at the turn of the last century, the Rambusch Company of New York and Jersey City is one of the very few that will survive into the new millennium. The firm, founded by a Norwegian immigrant, Frode Vladimir Christian Rambusch, is celebrating its 100th anniversary this month.

Though many architects are familiar with the company's lighting products, decoration was the firm's core business for much of its history (below, the studio in 1898). An ad Rambusch placed in the 1906 edition of Sweet's Catalogue lists its services as "interior decorations, mural painting, wall hangings, relief work, painting and wood finishing, and cabinet work." Among commissions listed in the young firm's ad were the Baltimore Cathedral, St. Jerome's Church in New York, the Grand Opera House in Cincinnati, and Brooklyn's Orpheum Theater.

The firm went on to decorate thousands of churches and cathedrals, hundreds of movie palaces, restaurants, academic buildings, and hotels such as the Waldorf-Astoria. Rambusch even had contracts to camouflage air bases during World War II. One of the firm's current projects is the redecoration of Conception Abbey in Conception, Missouri.

Viggo Rambusch, former president of the firm and grandson of the founder, attributes the firm's longevity to its never having adhered to any particular design style. The firm completed commissions in whatever look was popular, including Beaux-Arts and various revival styles, Art Deco, streamlined, Modern, and Postmodern. "We have always felt that it was the role of our designers to refine the ideas of the architect and the client, and not to dictate them," he says.

The firm is also well known for its lighting products. Legend has it that the firm began designing its own light fixtures in 1908, after Frode Rambusch became frustrated with the poor electric lighting that was obscuring some newly painted murals. In 1937 Rambusch patented the first recessed architectural downlight; the current catalog lists 1,081 variations of this basic design.

The firm is now operated by Edwin and Martin Rambusch, Frode's great grandsons, from a newly established factory and studio in Jersey City, New Jersey. *Charles D. Linn, AIA*



CLASSIC MEETS CONTEMPORARY **After two years of construction and renovation, the Danish National Gallery (Stanes Museum for Kunst) in Copenhagen reopened last month, showcasing a revamped 100-year-old main building and a new addition erected in the park behind it. The project's architects, Anna Maria Indrio and Mads Moller from local firm C. F. Moller and Partners, created a Modernist design for the new building (left), where predominantly 20th-century art is displayed. The rooms are minimally decorated and painted white, while the doors, window frames, and other detailing are graphite gray. The extension traces the length of the old gallery's north facade, with a glass-covered arcade connecting the two wings. Meanwhile, extensive restoration work has returned the classical main building, where older works are displayed, to its original appearance. The project nearly doubled the museum's space, to 315,000 square feet.** ***S.L.***



ATTENDEES AT GREEN CONFERENCE PONDER SUSTAINABLE RATING SYSTEM

There were neither winners nor losers among the teams of architects, building owners, engineers, and designers who entered the Green Building Challenge, a sort of cooperative and friendly competition among 14 countries to build the most ecologically sound building. Instead, the goal of the challenge, which culminated in a conference held in Vancouver in October, was to work to define an industry-level rating system for green buildings.

"There's no question that buildings of sustainable design are essential. We're already reaching the end of the earth's capacity," said William Rees, a professor at the University of British Columbia. "It's easy to say buildings should be green, but difficult to know how to make them that way."

Each of the 14 participating countries selected buildings in one or more categories, which included offices, residential structures, and schools. These were scored according to a list of environmental attributes, such as land use, water conservation, proximity to mass transportation, energy efficiency, and indoor air quality.

The scoring process used a benchmark based on "standard practice," or buildings that meet code but do nothing more to benefit the environment. The benchmark varied from country to country, and the regional nature of sustainable design was taken into account in other ways: for instance, what makes sense in one climate and economy won't work elsewhere, and products differ in availability.

"Ultimately, what we want to develop is a sort of environmental building code," said Lynn Foreschle, AIA. "We want to make it as easy to size up green performance as we can tell the gas mileage of a car."

The conference addressed other issues that come with sustainable design: using software programs that evaluate energy performance, selecting sustainable products, making green buildings attractive, and professional liability. *Wendy Talarico*

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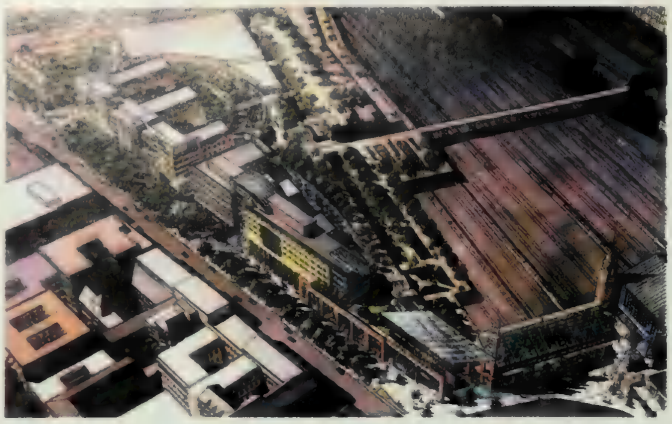
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EIFFEL'S BUDAPEST STATION TO GET A MODERN EXTENSION

The spirit of Alexandre Gustave Eiffel is alive and well in downtown Budapest. His artistry can already be seen in the Nyugati (Western) Railway Station, designed and built in the 1870s, and his legacy will be visible in TriGranite Development Corp.'s $200 million West End City Center, an office-and-shopping complex currently under construction adjacent to the station.

But unlike the Eiffel Tower, which soars 984 feet into the Parisian sky, the new center's buildings will reach a height of 88.5 feet at most and sprawl across approximately 12.4 acres.

A new commuter station will connect the center to Nyugati Station, which has been an important hub for travelers and daily commuters for over 100 years. Trams, buses, an underground Metro line, and commuter and international trains all converge at the terminal and the square it dominates. More than 400,000 pedestrians and 225,000 vehicles pass by daily.

In designing West End City Center, Finta and Associates Architect Studio "used elements of the old [terminal]," according to Jozsef Finta, the firm's managing director. "We think it's a beautiful building and we didn't want to break the continuity. For example, the glazed roofs of the new commuter station and the main entrance to the center will have the same 22-degree pitch as the roof of the terminal." The present commuter terminus, scheduled for demolition, "is garbage," says Finta.

Four separate buildings will house a 65,000-square-foot hypermarket, a 14-screen multiplex cinema, more than 150 specialty shops, over 300,000 square feet of leasable office space, a five-star casino hotel, and indoor parking facilities for 1,700 vehicles. There will be an 80-foot-wide promenade along the street side of the complex, and a landscaped roof garden with an ice skating rink will extend over the tracks leading to the commuter station.

The first phase of construction began last year. The retail/entertainment portion is scheduled to open next November; the hotel and office components will open later the following year.

"It's the largest project of this kind in Central Europe since the fall of Communism," claims Brian Jenkins, chief development officer for TriGranite, a joint venture between the Toronto-based real estate giant TrizecHahn Corp. and a major Hungarian real estate firm, Polus Investment Co. "It's longer than six blocks in New York City," Jenkins adds.

And the complex will become even larger. Ensuing phases will include residential facilities and additional office space, with completion slated for 2005. *Carl Kovac*

BIG, BUT NOT THAT BIG: PALM BEACH CONTEMPLATES SCALE

Palm Beach has always had its share of big houses, to say the least, but in recent years the winter home of America's rich has been beset with stylistic problems.

New owners, not happy with the Old World eccentricities of Palm Beach's 1920s houses, have chosen to alter, expand, and otherwise deface important pieces of the town's architectural legacy. Speculators have bought smaller, simpler houses—some of them dating to the early years of the century or even before—and assembled two- and three-lot parcels for new houses that overwhelm the old.

Two separate but complementary ideas have been proposed to grapple with the problems of scale, style, and visual intrusion brought about by the town's newest and biggest additions.

The Palm Beach Civic Association asked New York planning consultant and Yale professor Alex Garvin to create urban design strategies for the north end of town, where many of the more egregiously big houses have appeared. Garvin, working with Miami architect and garden historian Joanna Lombard, proposed a series of landscape interventions that would appease the eye and enhance the "continuity and distinctiveness" of Palm Beach streets.

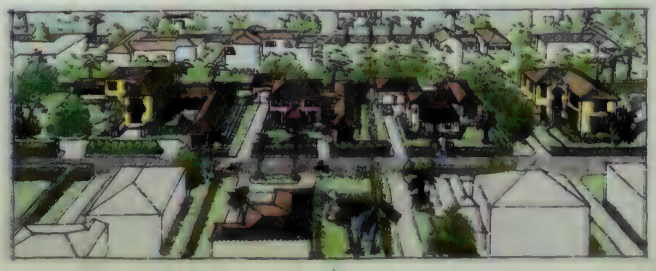
The Palm Beach Preservation Foundation hired Ray Gindroz of Pittsburgh's Urban Design Associates (UDA) to create a model for future development based on the ideas of 19th-century architectural pattern books. Gindroz put together a pattern book for Disney's town of Celebration, and has used the same approach in other cities.

Gindroz and his staff spent almost 100 hours looking at and recording Palm Beach's architecture, to begin to understand it as "a remarkable ensemble of urban and public spaces," he says.

Palm Beach has long been the winter resort of choice for America's most moneyed, who moved into Mediterranean-inspired houses by such architects as Addison Mizner and Maurice Fatio. "These are discreet houses," Gindroz told Palm Beach's Planning and Zoning Commission at a hearing last month. "The composition is superb. The proportions are correct, balanced, harmonious. The use of decoration and ornament is restrained."

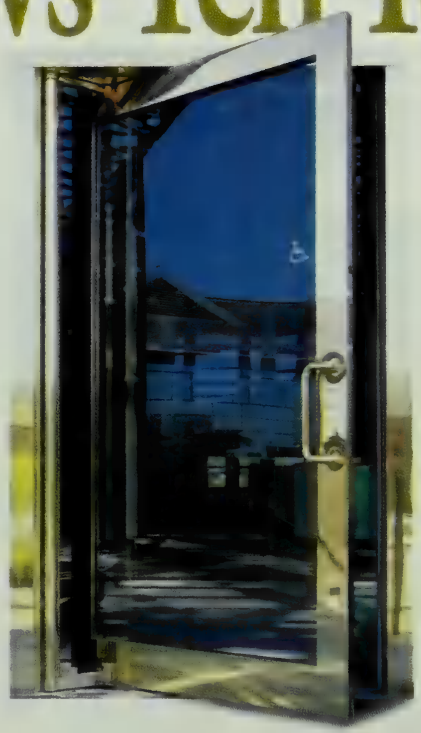
Gindroz's studies show that most of Palm Beach's greatest landmark houses could not be built under the current zoning, a code that leads more to "inflated-looking, pumped-up houses with monster roofs." (UDA's "ideal plan" for Queens Lane is shown below.)

Gindroz's study starts to provide an alternative to that zoning; it proposes a pattern book as an overlay to a stricter code, so that architects and developers who would like to build bigger must follow time-tested approaches to siting, massing, and form. The next step is for the city and its various boards to decide whether to proceed with a full pattern book as a way to keep the attack of the "monster houses" at bay. *Beth Dunlop*



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NEWS BRIEFS

Quite a pair After creating perhaps the most talked about design of the decade, the Guggenheim Museum in Bilbao, Spain, Frank Gehry and the Guggenheim could be teaming up again. According to reports, the museum is planning a large new branch, to be designed by Gehry and built on New York's West Side, at the Hudson River off Houston Street. It would be built on state land in the middle of a new shorefront state park, and would be the third Guggenheim in Manhattan—though the SoHo branch is losing money and has an uncertain future.

Prado picks Moneo Spanish architect Rafael Moneo has won a competition to enlarge the Prado Museum in Madrid, Spain's Ministry of Culture has announced. His design was selected from projects by the 10 finalists in a 1996 open international competition that ended without a winner. The extension, to be located behind the existing building, used by the museum since 1819, will house temporary exhibition galleries, visitor services, and modern technical facilities.



At 85 feet, this highboy in North Carolina lives up to its name.

Curtain raiser Construction has started on the latest in a series of new buildings that is changing the face of Times Square. The New 42nd Street Studios, a 10-story structure housing rehearsal studios (much needed in the area), offices, and a small theater named The Duke, was designed by Platt Byard Dovell Architects. The $23 million costs are being covered by public and private funds. Meanwhile, a development that would include as many as 11 small theaters and 350 new apartments is being planned for Theater Row, a stretch farther west on 42nd Street. A large theater and some smaller ones would likely occupy the base of a new mixed-income apartment tower. The project will be financed primarily by the state-sponsored 42nd Street Development Corporation, with some private help.

Good connections Robert A.M. Stern is already having an effect in his new role as dean of the Yale School of Architecture. He's lured architects Philip Johnson, Hendrik Koning, Julie Eizenberg, and Charles Gwathmey to sign on as visiting professors for next spring. Each will present one lecture and instruct a studio course. In addition, Bernard Tschumi, Peter Eisenman, Rafael Viñoly, Michael Sorkin, and others will give lectures.

Biloxi bound Frank Gehry is also set to commence work in the spring on the design for a museum in Biloxi, Mississippi, to showcase the region's culture—in particular, the work of George E. Ohr, known as the "mad potter," whose ceramics did not receive acclaim until long after his death in 1917. The city has pledged $1 million toward construction. Former Mayor Jerry O'Keefe, who is raising funds for the $8 million project, has donated $750,000.

Well furnished You've heard of the "Chippendale Building," the nickname for Philip Johnson's AT&T (now Sony) Building in New York, whose cutaway top resembles a piece of furniture. Taking the idea a step further, the Furnitureland South Mart

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in High Point, North Carolina—known for its home furnishings market—has constructed an 85-foot-high replica of a highboy chest to sit at its front door. Furniture designer Sid Lenger designed the facade, which is made of Outsulation, an exterior insulation and finish system. The detail work on the top is made of foam.

Eastern philosophies New York's Van Alen Institute, a civic organization devoted to public architecture, has given first prize in its "Design Ideas for New York's East River" competition to Victoria Marshall and Steven Tupu, who suggested that waste accumulation be used to build livable and evocative landscapes on the waterfront. Other schemes, on display at the institute through February, ranged from a series of interlocking parks to a new subway line running along the river.

Trumped again Donald Trump isn't short on ambition. The developer, who has long wanted to build the world's tallest building, is settling for the claim of New York's tallest residential building. Trump has hired architect Costas Kondylis to design Trump World Tower; Kondylis's 900-foot-tall building, sheathed in a bronze glass curtain wall, would house 376 luxury condominiums, a health club, and a restaurant. If all goes according to plan, the building will be in place on its site across from the U.N. sometime soon after the turn of the millennium.

New doings at DMJM International architecture and engineering firm Daniel, Mann, Johnson, & Mendenthal has reshuffled by combining its architectural and interior design divisions to form a new, as yet unnamed practice. The move coincides with the departure of Richard Keating, FAIA, who had headed its design practice, and the return of Paul Danna, AIA, who was at HOK.



Trump's latest gesture.

The show won't go on The site of Hungary's new National Theater (June, page 40) may now become an underground parking garage. In late October, the newly elected government, citing cost overruns, killed the project after $11.5 million had been sunk into excavating the site, near Budapest's city center, and pouring the foundation. Plans now call for a smaller theater, to be built in or near City Park. As for the National Theater site, since the underground parking garage is almost completed, that's probably what it will become.

Harry Weese; Albert Frey Harry Weese, a Chicago planner and architect best known for designing the Metro system in Washington, D.C., died last month at age 83. Weese also oversaw the renovation of both Adler and Sullivan's Auditorium Theater and the Field Museum in Chicago, while designing new structures such as that city's Time and Life Building.

Albert Frey died last month at the age of 95. Early in his career, the Swiss-born Modernist worked in Le Corbusier's atelier; later, his houses and buildings had a great impact on the Palm Springs area. ■

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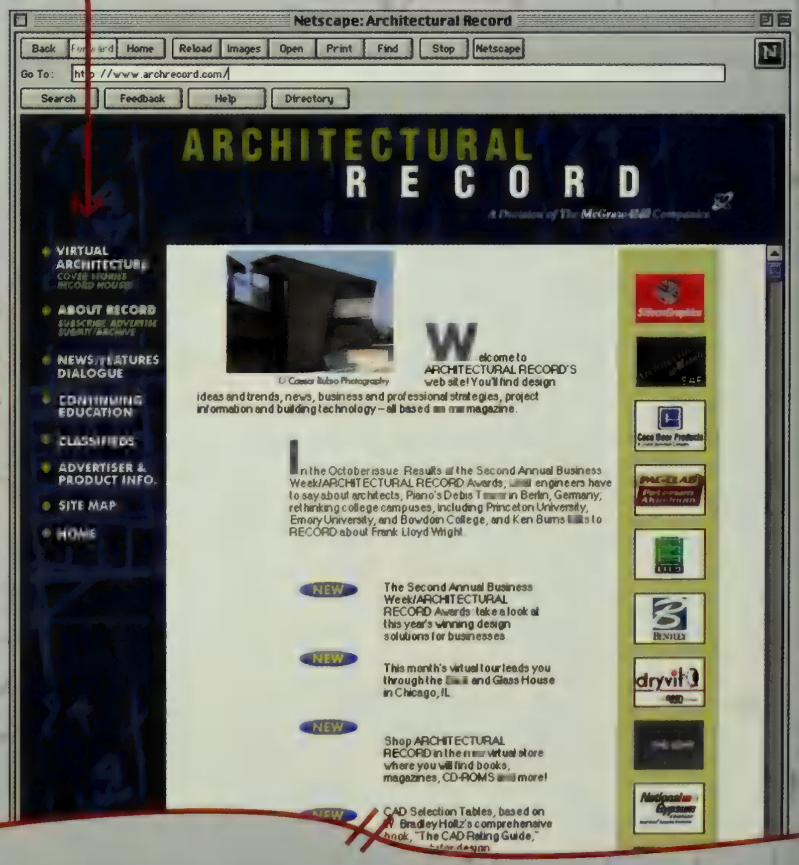
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DATESEVENTS

Calendar

Equal Partners
Northampton, Mass.
Through December 13
A celebration of male/female professional collaborations, featuring the work of 15 American firms founded and run jointly by men and women, including Arquitectonica, Asymptote, Hodgetts + Fung, and Tod Williams Billie Tsien Associates. Smith College Museum of Art. 413/585-2760.

New Chicago Skyscrapers: The Year 2000
Chicago
Through December 31
An exhibition of new skyscrapers that will be completed early in the next millennium, a welcome relief from the drought of construction in downtown Chicago over the last decade. Included are buildings by DeStefano & Partners, Solomon Cordwell Buenz, SOM, and others. Chicago Athenaeum. 312/251-0175.

The American Dream by Mail Order
Chicago
Through December 31
An exhibition exploring the history of Sears, Roebuck & Co. catalog houses built between 1908 and 1940. Chicago Architecture Foundation. 312/922-3432.

New Ways of Revitalizing the American City
Washington, D.C.
Through January 3, 1999
An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

La Présence des Objets: Gaetano Pesce
Montreal
Through January 3
Furniture, objects, models, and plans of recent projects by the architect and industrial designer. Musée des Arts Décoratifs de Montréal. 514/284-1252.

The Elusive City: Photographs of Houston by Paul Hester
Houston
Through January 3
Approximately 40 black-and-white photographs of Houston from the late 1970s to the present. Menil Collection. 713/525-9404.

Japan 2000: Kisho Kurokawa
Chicago
Through January 3
A retrospective of the Japanese architect's work, from his early Metabolist projects to his current addition to the Van Gogh Museum in Amsterdam. Art Institute of Chicago. 312/443-3600.

Robert Adam: The Creative Mind
Washington, D.C.
Through January 3
An exhibition of drawings by the 18th-century neoclassical Scottish architect, demonstrating his design process from conception to final presentation. The Octagon. 202/638-3221.

The Work of Charles and Ray Eames
London
Through January 3
A comprehensive traveling retrospective of the work of the great modernist designers, organized by the Vitra Design Museum and the Library of Congress. More than 500 examples of their work, from furniture to toys, are included. Design Museum. 011/44/171/378-6055.

Bechtel's First Century
Washington, D.C.
Through January 4
A portfolio of projects by the San Francisco–based Bechtel Group, one of the world's largest engineering and construction firms. Highlighted projects include the Hoover Dam, San Francisco's rapid-transit system, and the Channel Tunnel between England and France. National Building Museum. 202/272-2448.

Tensions in Architecture
New York City
Through January 5
An examination of the extraordinary recent developments in the materials and technology of tensile structures. Material ConneXion Gallery. 212/445-8825.

Ad Fontes: The Art and Projects of Vebjorn Sand
Washington, D.C.
Through January 8
An exhibition of works by the Norwegian artist, including documentation of three unusual public projects: a highway bridge modeled after one of Leonardo's designs, a troll's castle built of ice and snow, and an installation based on the discoveries of astronomer Johannes Kepler. AIA Headquarters Gallery. 202/638-3221.

Designing the Disney Theme Parks
New York City
Through January 10
"The Architecture of Reassurance" examines how Disney attractions are conceived, planned, and built. On display are 200 plans, drawings, paintings, and models from Disney archives, many of which have never been publicly displayed. Cooper-Hewitt National Design Museum. 212/849-8300.

George B. Post: Great American Architect
New York City
Through January 10
Among the works featured in this exhibition of the late 19th- and early 20th-century architect are renderings of the long-demolished Equitable Life Assurance Society (the first building to use elevators) and the Western Union Building (the first to reach 10 stories). New-York Historical Society. 212/873-0509.

Premises: Invested Spaces from France
New York City
Through January 11
An exhibition of visual arts, architecture, and design in France from 1958 to 1998 that underlines the relationship between the artist/architect and the constructed environment. Included are models, drawings, photos, and installations by Christian Boltanski, Yves Klein, Le Corbusier, Jean Nouvel, and Annette Messager, among many others. Guggenheim Museum SoHo. 212/423-3500.

All Wright: The Dana-Thomas House
Chicago
Through January 31
An exhibition showcasing the most complete and best-preserved example of Frank Lloyd Wright's early Prairie houses. Chicago Architecture Foundation. Call 312/922-3432 or fax 312/922-0481.

Main Street Five-and-Dimes
Miami Beach
Through January 31
Photographs, drawings, architectural fragments, and store merchandise document the architectural history of one of America's foremost chain store operations, S. H. Kress & Co. The Wolfsonian, Florida International University. 305/535-2631.

Louis Comfort Tiffany at the Metropolitan Museum of Art
New York City
Through January 31
Nearly 100 Tiffany works from the museum's collection, including windows, lighting fixtures, and objects, are featured. The full-scale entrance loggia from Tiffany's Long Island estate is also on view. Metropolitan Museum of Art. 212/570-3951.

Cities on the Move
New York City
Through February 7
This exhibition brings together artists, architects, filmmakers, and other "creators" who explore the

(continued on page 48)

(continued from page 47)
shapes and forms of Asian cities. PS.1 Contemporary Art Center. 718/784-2084.

Monuments of the Future: Designs by El Lissitzky
Los Angeles
Through February 21
An exhibition of works by the early 20th-century Russian artist, including designs for utopian skyscrapers. Getty Center. 310/440-7300.

Incandescence: Watercolors by Lauretta Vinciarelli
San Francisco
Through February 23
A series of paintings commissioned by SFMOMA that examine the relation of space to the horizon line. San Francisco Museum of Modern Art. 415/357-4000.

The Cartoons of Roger K. Lewis
Washington, D.C.
Through February 28
More than 100 cartoons satirizing the state of architecture and urban design, originally published in the *Washington Post*. National Building Museum. 202/272-2448.

Design Ideas for New York's East River
New York City
Through February 28
On display are entries to the Van Alen Institute's ideas competition to transform the East River into public space, and the New East River Park Project by Reiser + Umemoto Architects. Van Alen Institute. 212/924-7000.

Unlimited by Design
New York City
Through March 21
An exhibition of products, services, and environments designed to meet the needs of people throughout their life spans, from toddlers to the elderly, demonstrating the effect design can have on the quality of life. Cooper-Hewitt National Design Museum. 212/849-8300.

Forgotten Gateway: The Abandoned Buildings of Ellis Island
Washington, D.C.
Through March 28
A photographic exhibition documenting the deterioration of the historic hospital complex on Ellis Island, which remains untouched by the renovation that transformed the north side of the island. National Building Museum. 202/272-2448.

The Little Apple: Souvenir Buildings
New York City
Through March 28
On display is a collection of 125 miniature New York buildings, with the oldest souvenir dating from 1800. Museum of the City of New York. 212/534-1672.

Zigzags and Speed Stripes: The Art Deco Style
Pittsburgh
Through March 28
An exhibition that surveys the impact of the Art Deco style on architecture and design, tracing the interwar phenomenon from zigzag moderne to streamlined moderne. The exhibition complements the permanent installation of *The Chariot of Aurora,* a gilded and lacquered relief from the SS *Normandie*. Carnegie Museum of Art. 412/622-3131.

Building the Empire State
New York City
Through March 31
A documentary look at the design and construction of Shreve, Lamb & Harmon's 1931 Empire State Building. Skyscraper Museum. 212/968-1961.

Architecture on the Rise: Renderings by Hughson Hawley
New York City
Through April 4
Hawley's watercolor drawings from 1880 to 1931 offer a vision of the developing city. Museum of the City of New York. 212/534-1672.

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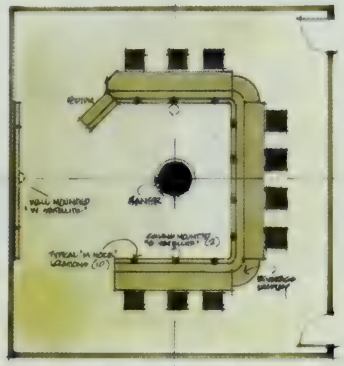
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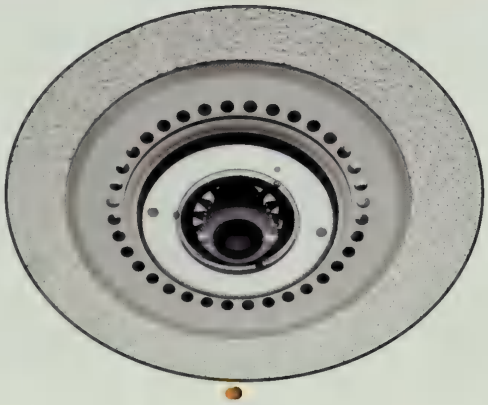
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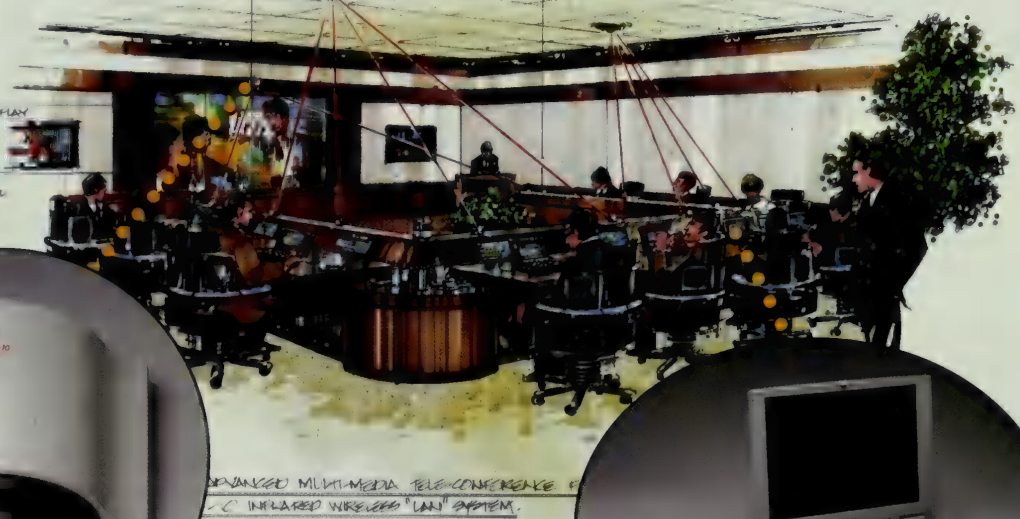
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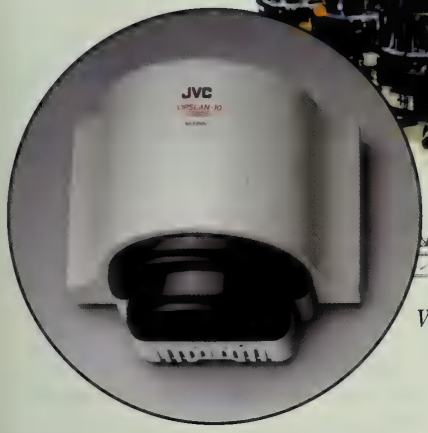


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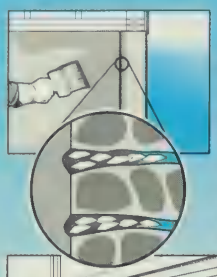
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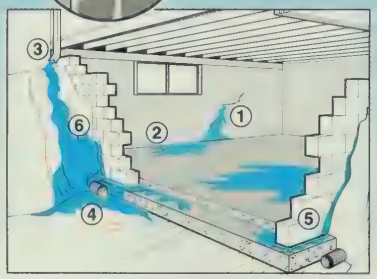
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(continued from page 48)

Beyond Architecture: Marion Mahony and Walter Burley Griffin
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Through May 2
This exhibition explores the professional and spiritual journey of architects Mahony and Griffin, from their years in Frank Lloyd Wright's office at the turn of the century through their work in Australia and India in the 1920s and 1930s. Powerhouse Museum. 011/61/02/217-0111.

Thermal VII
Clearwater Beach, Florida
December 6–10
A conference focusing on the latest technologies related to the thermal performance of building envelopes. The core conference and workshops meet AIA/CES criteria for quality levels II and III, respectively. Sheraton Sand Key Resort. Call Mia Prater at 423/576-7942 for details or E-mail her at unb@ornl.gov.

Photography and Transformations of the Contemporary City: Venezia–Marghera
Montreal
December 9–April 25
The work of 15 Italian photographers exploring the relationship between historic Venice and the modern, industrialized, and polluted mainland port of Marghera nearby. Canadian Centre for Architecture. 514/939-7000.

IASTE '98
Cairo, Egypt
December 15–19
This year's conference of the International Association for the Study of Traditional Environments examines how nations are cultivating traditional architecture as a means of attracting tourism. About 120 papers by scholars from around the globe will be presented. Contact the Center for Environmental Design, University of California at Berkeley, 510/642-2896.

Celebrating Chandigarh: Fifty Years of the Idea
Chandigarh, India
January 8–11
An international conference marking the 50th anniversary of the Punjab capital's conception includes discussions of how its design, by Le Corbusier and many others, affected city planning in developing nations around the world. Among the speakers are Charles Correa, Norman Foster, Ricardo Legoretta, Richard Rogers, Kenzo Tange, and Robert Venturi. Call 011/91/172/548742 or visit www.cperspectives.org for details.

International Builders' Show
Dallas
January 15–18
The world's largest convention and exposition geared to the home-building and construction industry will also host, for the first time, the International Commercial Construction Exposition. Dallas Convention Center. Call Jason Lowe at 202/861-2104 or E-mail jlowe@nahb.com for details.

Transformations: Mixed-Media Assemblages by Keith Krueger
Washington, D.C.
January 15–February 26
An exhibition of works by a local architect, who uses discarded elements from buildings and construction sites in his compositions. AIA Headquarters Gallery. 202/638-3221.

World of Concrete USA
Las Vegas
January 18–22
An exposition focusing on materials, equipment, and technology for the concrete construction, repair, and refurbishment industries. Las Vegas Convention Center. Call Maria Prior at 630/705-2578 or visit www.wocexpos.com for more information.

Solid Surface '99
Las Vegas
January 21–23
The International Solid Surface Fabricators Association's annual event will feature over 100 exhibitors and 5,000 attendees. Riviera Hotel. Call 702/567-8150 for more information.

Restoration and Renovation
Washington, D.C.
January 28–30
This year's International Exhibition and Conference for Traditional Buildings, Homes, Design and Craft will be held in the nation's capital to encourage networking with the public sector. Sheraton Washington Hotel. Call 978/664-6455 or visit www.egiexhib.com for more information.

Community Built Association Conference
Santa Barbara, Calif.
January 29–February 1
A conference run by an organization devoted to involving local residents in the building process. Attendees will include artists, architects, landscape architects, designers, builders, community gardeners, park and recreation officials, and community development specialists. La Casa de

(continued on page 52)



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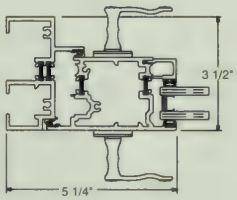
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(continued from page 50)

Maria. For more information, contact Kyle Cundy at 607/277-1650 or E-mail leathers@dreamscape.com.

National Roofing Contractors Association Convention
Phoenix
February 7–10
The NRCA hosts the largest roofing convention in the United States, attracting more than 8,000 attendees and 390 exhibitors. In addition to educational programs, there will be presentations by Gen. Colin Powell and humorists Dave Barry and Rita Rudner. Phoenix Civic Plaza. For registration materials, call 800/323-9545, fax 847/299-1183, or visit www. roofonline.org. For fax-on-demand, call 888/455-6722 and request document 1203.

Greenprints '99: Sustainable Communities by Design
Decatur, Ga.
February 22–23
A conference and trade show on environmentally appropriate building technology and sustainable community design, hosted by Southface Energy Institute and the Georgia Environmental Facilities Authority. Atlanta-Decatur Hotel and Conference Plaza. Call the Morningstar Management Group at 404/653-0606 for more information, or visit www.southface.org.

Inter Con '99
Orlando
February 24–28
A convention and trade show for the commercial interiors construction industry, sponsored by the Ceilings and Interior Systems Construction Association and *Interior Construction* magazine. Walt Disney World Coronado Springs Resort. For information, call 630/584-1919 or visit www.CISCA.org

AIA National Convention
Dallas
May 6–9
The theme of this year's convention, expected to draw as many as 14,000 people, is "Think Big, Make It Happen: Leadership in the New Millennium." Architects can earn all 36 Learning Units needed for AIA accreditation by attending seminars and exhibitor education sessions. Dallas Convention Center. For information, visit the convention Web site at www.aiaexpo.com (not yet online). For information on exhibiting, contact Hill, Holliday Exhibition Services at 617/572-3553.

Competitions

Rudy Bruner Award for Urban Excellence
Submission deadline: December 18
This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives $50,000. For more information, call 617/492-8401 x139 or E-mail info@brunerfoundation.org.

London AIA Excellence in Design Awards
Submission deadline: January 15
The awards program honors excellence in architectural design for work completed between January 1, 1993, and December 31, 1998. Eligible are projects by U.K.-based architects working anywhere in the world; projects in the U.K. by architects from anywhere in the world; and projects in the U.K by U.K.-based students. For more information, write AIA, Kent House, 14–17 Market Place, London W1N 7AJ, or fax 011/44/171/636-1987.

Young Architects Forum
Submission deadline: January 29
"Scale" is the theme of this year's competition sponsored by the Architectural League of New York. Open to architects and designers who have graduated from undergraduate or graduate programs in the last ten years. Winners receive a cash prize and are invited to exhibit their work and give a lecture at the Urban Center. For an entry form or for further information, call 212/753-1722.

(continued on page 160)

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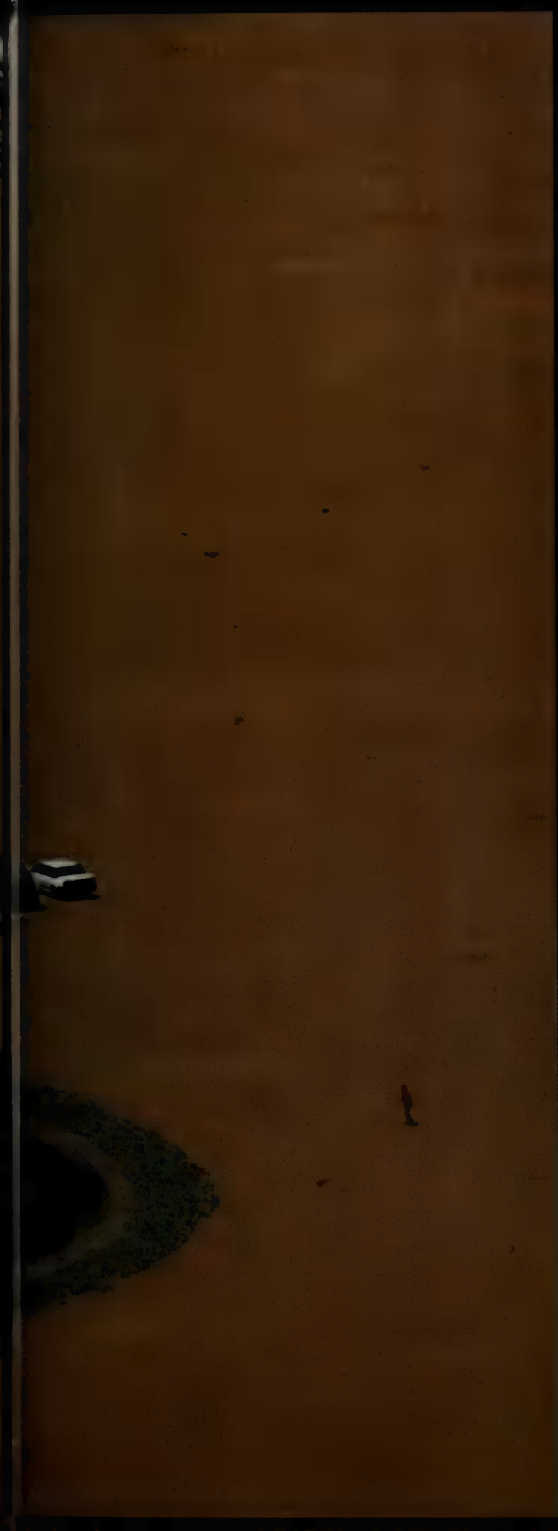
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Lines

Opposite: Off-road vehicles are launched from macadam, Winter Haven area, California, 1994. Above: Cul-de-sac layout, Bowling Green, Kentucky, 1997.

Photographs by Alex S. MacLean

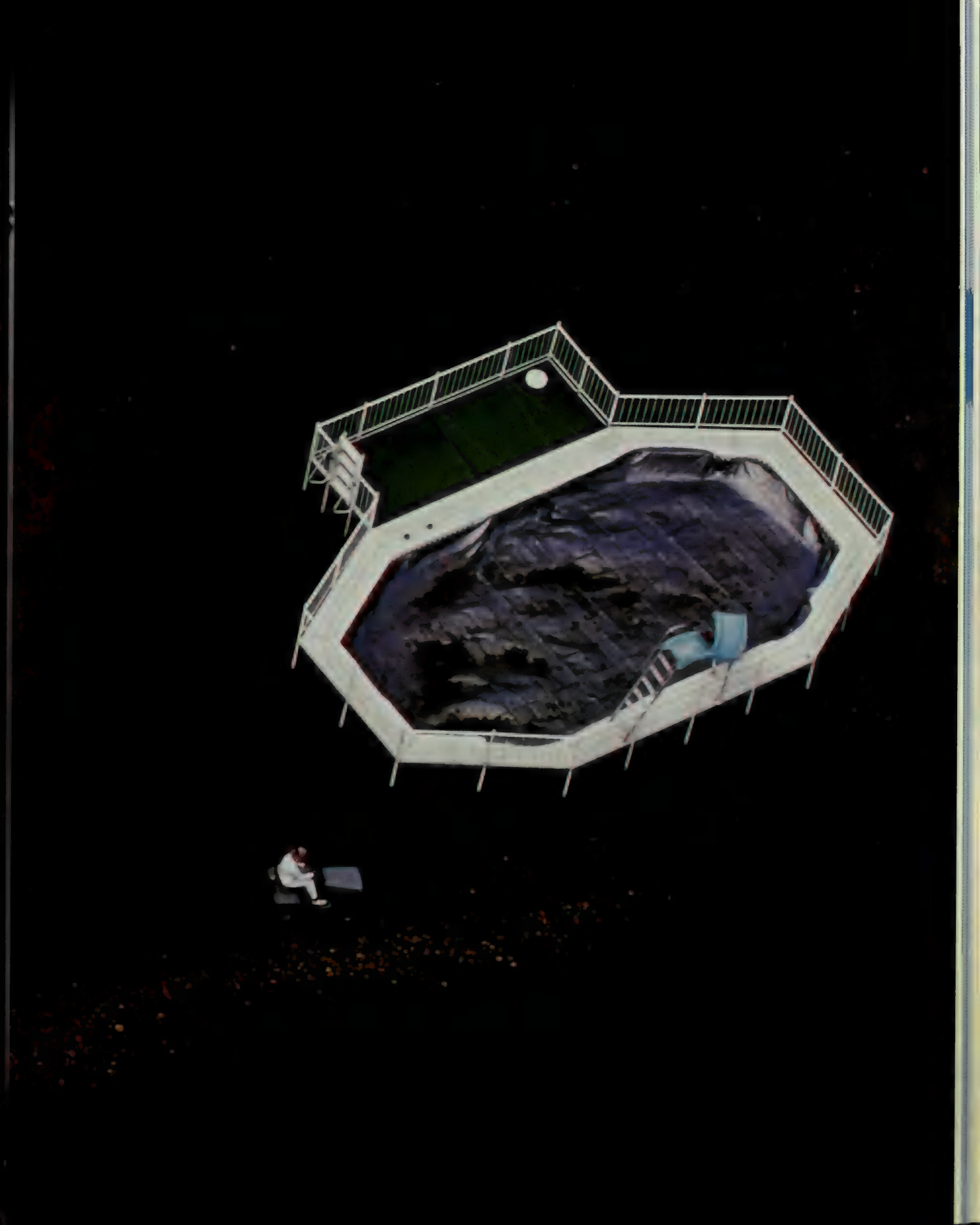
Step back and take a cosmic view of the world. That's what photographer Alex S. MacLean and writer James Corner did in their award-winning book, *Taking Measures Across the American Landscape* (1996). ARCHITECTURAL RECORD is pleased to present a collection of MacLean's previously unpublished images photographed from a high vantage point. Our selections illustrate the intersection of human intervention and the natural world—specifically, the relationship of construction and landscape. MacLean's work demonstrates how emphatically and forcefully the world is changed by human will, how directed and linear, how like a language, are the patterns that we make. Here are circumscribed pentagrams and octagons of suburban developments counterposed with the random lushness of the northeastern hills, the stylized inscriptions of asphalt paving laid like a ribbon on the desert, and the rhythmic grouse of simple storage buildings. All speak to intention and to transformation, and from such a height, even these simple artifacts sing. *Robert Ivy, FAIA*





Divisions in the Landscape

Top: Large lot subdivision, St. Albans, Vermont, 1996. Above: Phase of hillside construction, Dublin Canyon area, California, 1997. Opposite: Pool and lawn-boy, central New Hampshire, 1993.







Patricia

Opposite: Self-storage lockers, Lowell, Massachusetts, 1993.
Above: Storage lockers on cul-de-sac, Jericho, Vermont, 1994.



Planning for FIRM SUCCESSION

by John Morris Dixon, FAIA

Amid the anxieties of starting and running an architectural practice, the founders of a firm are not likely to think about who will succeed them. They are just hitting their professional stride, and their objectives rarely extend beyond simply surviving. But from the first day of business, an unwelcome and often frightening deadline looms: the day when the current principals must step down and make way for the next generation.

No matter when a firm confronts it, the issue of leadership and ownership transfer is a touchy one. The realignment of power involves establishing new leaders and ushering out the old ones, who are often reluctant to let go. It involves finding money to compensate former principals while coping with friction and competition among remaining staff members. And it involves maintaining a good image and a solid front so that clients see the firm as steady and reliable.

While ownership turnover is hardly a new issue, there are undoubtedly more firms considering it now than ever before. For one thing, there are exceptionally large numbers of principals confronting the prospect of retirement, however varied their ages. A large proportion of today's firms date from the prosperous postwar years, roughly 1950 to 1965, when the profession expanded rapidly. Many of the leaders, in their prime then, are now ripe for retirement.

The most recent recession also left a lot of pent-up demand for ownership transition. When a firm's finances are languishing, there is little incentive for anyone to seek ownership shares, or to offer them. Although financial markets are volatile today, most firms are prospering. Indeed, many cannot find enough help. That means now is a good time for transitions to take place. Staff members who survived the downturn have absorbed some tough economic lessons; no starry-eyed idealists, they are concerned and informed about the business of architecture. They want to be adequately rewarded for remaining loyal whether times are good or bad.

John Morris Dixon, FAIA, the former editor-in-chief of Progressive Architecture, *is a freelance writer based in Old Greenwich, Connecticut.*

Two Kinds of Firms

Though an architecture firm may be set up in various ways—as sole proprietorships, partnerships, or professional corporations—legal structure is not as important to the ownership transition process as is the firm's history. For the purposes of this article, there are two types of firms: those where the founders are still the owners and those that have gone through the transition process before.

Past experience can make a big difference in how leadership succession is handled. Second-generation principals tend to focus on maintaining the firm's continuity rather than their personal reputation. They are likely to view ownership transition more objectively and to think about the next transfer of power from the day they take the reins. By comparison, founding partners often don't think about succession until they have to, which is often too late. It is hard for them to imagine the firm without them; it is a part of their identity. Founding partners have the hardest time letting go. In fact, some simply can't.

The death of a firm's senior principal may complicate the ownership transition process. If the heirs become embroiled in an estate battle or a dispute with the surviving partners over the value of the firm, untangling the matter in court could take years.

A buyout is most difficult financially if a firm is entirely owned by one individual, or by two or three partners of about the same age who want to retire at about the same time. So much change all at once is not only disruptive to a firm, it also creates financial strains: buying out the retiring owner or owners overtaxes the new principals, especially if the decision is a relatively sudden one and the new partners haven't had an opportunity to reserve some money. The selling partners, too, will feel the



THERE IS AN OWNERSHIP TRANSITION IN EVERY FIRM'S FUTURE, IF IT IS TO HAVE A FUTURE.

effects, since they are likely to get less money for their shares or will be forced to wait for their money.

The greatest challenge comes when a firm is headed by a star architect, one with a strong design reputation and whose firm carries his or her name. All of the firm's appeal in the marketplace, and often the ownership as well, is invested in one individual. Firms headed by a design celebrity rarely survive after that person's departure. But there are exceptions, rare instances when architect stars have determinedly provided for the continuation of their firms and their name. Marcel Breuer and I. M. Pei, for instance, both made full-fledged partners of younger associates while they were in the heyday of their practices. Breuer's successor firm flourished briefly after his death, then disbanded. But Pei Cobb Freed & Partners has continued to prosper despite Pei's retirement, though the question now is who will succeed Harry Cobb and James Freed in the firm's name.

If a firm is to survive, it must take a hard look at its staff, its resources, and its long-term goals. Whatever the structure of the firm, ill-considered succession decisions can negate the years of effort that went into building it. Successful ownership transition demands the full attention of current principals and potential ones, and it calls for some soul-searching.

Developing a Transition Plan

Effective transition involves sharing ownership with valuable talents and potential leaders on the staff as soon as they can be identified. Firms should begin succession planning when the current owners are in their 40s, advises Boyce Appel, an Atlanta-based management consultant. Plans must be in place early enough to allow adequate transition time for those moving into senior management positions. Unless incoming principals have the opportunity to gain adequate experience in leadership roles, they may be ill equipped to do their jobs and inspire confidence that the firm can maintain its momentum. That's not only detrimental to the firm, it may reduce the amount that departing principals will get for their ownership shares. Worse yet, late plans are more likely to be disrupted by death or disability.

Why is transition planning so seldom started early? One reason is that current owners are reluctant to share control and accountability. And any planning for transition is difficult psychologically, says Perry King Neubauer, FAIA, of ADD Inc., in Cambridge, Massachusetts, because it signals a first step toward retirement, implying the loss of identity, authority, and income. Everything the owner has worked for over the years is about to be handed over to others while being coldly evaluated in dollars and cents.

This process is not easy, yet refusing to face it can damage the whole firm. "For your own good and for the good of the company, put your ego aside and start planning early," says Leonard Peterson, FAIA, president of O'Donnell Wicklund Pigozzi & Peterson Architects of Chicago. His firm has made identifying and training potential partners one of its guiding principles (see sidebar, page 63). Doing so makes the transition process more gradual and, therefore, smoother. Also, Peterson knew that if he and his associates didn't take the initiative in making succession plans, they might find themselves reacting to demands by key staff members instead of orchestrating the changes themselves.

There are essential financial details to every transition plan, including how payments are made to outgoing principals, the basis for valuation of shares, and the number of votes each share brings. But most of these issues can be worked out with a lawyer once the more important fundamentals of the plan are decided. Laying the foundation of a good transition plan requires studying every aspect of a firm—its clients, its staff, its modes of operation, and its goals. Lawyer and consultant Paul Lurie of Schiff, Hardin & Waite in Chicago draws an analogy to architectural design: the most important part is the programming and conceptual

PHOTOGRAPHY: © IAN TONG, EXCEPT AS NOTED; JOEL PULIATTI (TOP, SECOND FROM LEFT)



COO Bob Mattox (left) was brought in from outside to join Payette Associates chairman Tom Payette (center) and CEO Jim Collins (right).

PROFILE

Payette Associates in Boston was structured to allow partners to play a major role in governing their firm. Tom Payette, FAIA, is a second-generation owner himself, having been chosen at the age of 33 to succeed Paul Nocka and Frederick Markus, who founded Markus & Nocka in 1931. (The firm became Markus Nocka Payette & Associates in 1970.) Since those early years, Payette has been committed to sharing ownership with promising staff members, as Markus and Nocka had with him. He is critical of owners of architectural firms who wait until the next generation of leaders is in their 50s or beyond before they turn over control.

Payette's ongoing goal is to create ownership equalization, ideally with each partner having the same number of voting shares. This is a collaborative approach that guarantees a balance of power among partners—there are now 11—and also helps ensure their full commitment to the firm.

When an employee becomes a partner, he or she may be granted one-third or one-half of full voting rights. The balance is granted over a period of a few years. But that doesn't mean that leadership is similarly dispersed. Payette Associates' officers are responsible for day-to-day operations. The firm is governed by a five-member board, while the partners are involved in making general planning and strategic decisions.

"Leadership and ownership are distinct from one another," says Payette. But, as CEO Jim Collins Jr., AIA, explains, "It was the partners—the firm's owners—who gave the leaders their authority to start with. In other words, the owners chose to have it this way. The purpose of management is to maintain a balance between running a business and keeping the quality of design high."

Last year Payette, who has headed the 120-member firm since 1973, decided to reduce his day-to-day management responsibilities. Collins, who has been with the firm for 18 years, became president and CEO, and Payette became chairman of the board. But a search for a COO within the company was unsuccessful. With guidance from the Coxe Group, management consultants who specialize in working with architectural firms, Payette found Robert Mattox, FAIA, who joined the company as COO last year. Mattox not only has experience with architectural firms, he also ran a company that created architectural management software.

Bringing in outside talent as needed can be successful, Payette says, as long as those individuals have the same kinds of goals and ethics as the firm. But he does not advocate choosing people from outside the profession. While some firms have introduced managers from other fields, Payette feels that this can be divisive: outsiders don't necessarily understand architectural work well enough to make such a relationship prosper.

design. The firm that just wants to draw up a quick buy-sell agreement to effect a transition is something like a client who just wants a quick set of construction documents.

Much of the research and analysis involved can be done by members of the firm itself, though consultants may be useful in setting up some guidelines (see sidebar, page 64). The benefits of such self-examination, though, can extend far beyond the succession plan itself and help the firm to redirect its efforts or even reevaluate its goals.

Ownership transition planning should be entrusted to a specially appointed in-house task force. The plan will probably take months or even a year to prepare, depending on the level of commitment of those involved. But it is crucial to agree on a plan within a reasonable time. If the process drags on for years, as it has been known to do, prime candidates for ownership may get exasperated and leave. Disagreements can also develop, with the risk that some dissenters will depart. But such departures may also be to the long-term benefit of everyone concerned.

Once a plan is drawn up, it is essential to explain it fully and candidly to everyone in the firm. "Many plans fail," Lurie says, "because little effort is made to sell them."

Identifying the Next Principals

When Martin Raab, FAIA, was first offered a partnership at HLW in New York City, he was told by his seniors: "Your first job is to find your successor." Since partners usually aren't compensated for their stake in the firm until they retire from ownership and are bought out, Raab

EVALUATING THE WORTH OF THE FIRM



Crucial to the transfer of any ownership shares is placing an accurate value on the firm as a whole. As one wise old sage has said, the most important assets an architecture firm can possess can't be bought: "blue sky and goodwill."

One common measure is book value: the total value of a firm's financial assets minus its liabilities. But Peter Piven of the Coxe Group stresses that value must not be set by simple rules or formulas but by a careful assessment that is adjusted to such factors as real estate ownership, backlog of work, marketing prospects, and whether all people in key positions will be retained in the transition.

Internal sale of ownership shares is typically about 10 to 30 percent above book value. The added percentage is calculated based on such hard-to-define qualities as the firm's reputation, the promise of continuity, and confidence in the newly aligned leadership.

If firms are sold on the outside—to other firms, for instance—the buyers may pay up to twice the book value, assuming that the merger enhances the efficiency and revenue potential of both firms.

recognized the importance of putting a good team in place and retaining their respect. That way, the firm would be willing and able to compensate him and his associates adequately when they departed. Effort also had to be invested in making the successors function as a team, since staff members with leadership qualities are bound to be competitors from the start and to remain competitors. When he retired in 1996, Raab left behind a thriving firm.

Many lists of desirable qualities for ownership candidates have been drawn up. The distinction between owners and leaders is more than mere semantics. Not all architects with skills essential to the firm have either the ability or the desire to exercise leadership. It must be made very clear to those who are given ownership without an obligation to lead that they must support the designated leaders. They may have a voice in partner or shareholder meetings, but their support of the leaders is essential to the firm's survival and, ultimately, its succession to the next generation of leaders.

However ownership may be dispersed, it is widely agreed that an effective firm should have a single, buck-stops-here leader. "Camaraderie among partners is vital, but there has to be one individual who wants to lead and commands the respect of both clients and staff," says Tom Payette, chairman of Payette Associates in Boston (see sidebar, opposite page).

Founders should avoid hunting for successors with characteristics that match their own. First-generation leaders have an entrepreneurial spirit that is invaluable in launching the firm. These qualities may

FOUNDERS SHOULD AVOID SUCCESSORS WITH TRAITS SIMILAR TO THEIR OWN.

be hard to find among employees who choose to stay with an established firm and, more important, they may not be the most essential for perpetuating it, says Hugh Hochberg of the Coxe Group, management consultants in Seattle. Ideally, a leadership team should have a combination of first-generation enthusiasm and second-generation cautiousness.

As a way of retaining the most promising candidates for succession within the firm, Hochberg proposes singling out employees with leadership potential early in their careers. His recommendation is to announce that such individuals have been selected as principals-to-be, then to begin grooming them for the roles they will be filling 10 or more years later. The risk of error in such selections is small if they are carefully done, he contends, since traits consistent with leadership—effectiveness, talent, insight, intelligence, dedication, maturity, and modesty—evidence themselves early. Payette, who took over leadership of his firm at the age of 33, finds it ironic that principals looking for successors hesitate to elevate 35-year-olds to leadership positions, when statistics show that the average age for starting a practice is 31.

It is essential to involve valuable members in this strategy and to explain it carefully throughout the firm. It's also necessary to emphasize that these designees are not the only candidates. Grooming someone to be a principal doesn't preclude others from having a shot at the job. There is always the possibility that the principals-to-be could be lured away or leave the firm on their own. The risk of developing and then losing potential leaders must be weighed against the risk of not developing them at all.

Simply identifying next-generation leaders is not enough. They must be put in positions to develop the leadership skills they will need. Management skills in particular must be nurtured. If a potential principal is sent off to earn an MBA, he or she must be allowed to put this knowledge to the test in the firm, or the value of the degree will be lost. Ideally,



OWP&P founder Ray Pigozzi (left) with Len Peterson (center) and Bob Hunter (right), who later became partners in the firm.

O'Donnell Wicklund Pigozzi & Peterson Architects, a 255-person architecture/engineering firm in Chicago, began searching for new officers 10 years ago. The process gave the original owners a chance to do some soul-searching, examining and redefining the long-term goals of the company and its leadership principles.

Founded in 1958, OWP&P began planning for change in 1988, when Len Wicklund, FAIA, the firm's CFO at the time, and Larry O'Donnell, FAIA, announced their retirement plans. But it wasn't until February 1995, after months of research and intensive meetings, that an in-house task force produced a set of transition guidelines.

The guidelines spell out the steps to a smooth transition, as well as stating that the most important quality the firm's leadership can possess is high ethical standards. The leaders must assume responsibility for the firm's successes and limitations, trust fellow principals, and show a willingness to take personal risks for the good of the firm. While marketing is essential to the firm, bringing in work is not a prerequisite for becoming a principal, says Leonard Peterson, FAIA. The guidelines are specific about the retirement process. Partners can cut back incrementally, but salaries and bonuses are reduced proportionately. Retirement from the board of directors by the age of 65 is mandatory, and board members must give at least three years' notice. They are expected to sell their ownership shares over that three-year period, although this can be extended to 10 years so the number of shares for sale is balanced with the number of buyers.

Principals identify candidates for each key leadership position and mentor them for their future roles. When Wicklund confirmed that he would retire at the age of 65, the firm provided financial assistance to partner Gary Wendt, AIA, so he could get his MBA and would be ready to become CFO.

New principals must "write a check" for their ownership shares. Associate principals generally hold 1 to 3 percent ownership shares, principals hold 3 to 5 percent, and senior principals hold up to 10 percent. Bonus compensation can be put toward the purchase of shares, and the firm will help to arrange loans. Such a pay-as-you-acquire policy demands adequate compensation, but it also provides performance incentives.

Since OWP&P has a federally recognized employee stock ownership plan, the value of the firm must be recalculated annually by an outside accountant (calculating the value in-house invites conflict).

Although principals who are in the process of selling their shares now account for 60 percent of the firm's ownership, long-term decisions—like a recent move from the Chicago suburbs into the Loop—are left to those they will affect the most, the younger principals.

Principals Angie Lee (left) and John Seivertson (right) and senior partner and CFO Gary Wendt (center) are among OWP&P's new leaders.





[illegible] HIRE A CONSULTANT

What is the function of a consultant in a transition plan? As Paul Lurie explains, any lawyer can handle the technical questions. The valuable expertise a consultant can bring is in dealing with the process and the human issues. In earlier days, there were many consultants who simply offered a cookie-cutter solution. A partner of a major firm once received a recommendation from a consultant on which the name of another firm appeared.

Now it is widely understood that the consultant must learn the culture of the firm. This does not necessarily imply that the firm must invest in an expensive consultant's study; to a large extent, Boyce Aupied points out, the firm can do the research, with the consultant acting as a facilitator.

Consultants come from backgrounds like law, as Lurie does, or accounting or business management. "The trouble with some of the best-known consultants is that they are strongly bottom-line oriented," says Peter Piven, an architect as well as a consultant. "They try to convert architects to this profit orientation, which is contradictory to the culture and inclinations of most architects."

special opportunities should be created for potential successors to hone and test their leadership skills. One excellent way is for next-generation candidates to head branch offices where they will face the kinds of challenges they will be exposed to as leaders, but on a smaller scale.

If members of the owners' families are in line for succession, the picture changes in significant ways. David Martin and his cousin Chris Martin, of A. C. Martin Partners in Los Angeles, represent the third generation of family ownership of their firm. In some ways, David Martin says, the issue of succession is easier in a family setup. There is no question as to who will lead the firm next. But there are family dynamics to contend with—a parent who doesn't want to retire, spouses who may want to get involved, family members who feel left out, incompetent relatives who cannot be gracefully dismissed.

Family-owned firms also run the risk of alienating anyone outside the family who has management ambitions. The Martins have responded to the lack of ownership opportunities for those outside the family by providing a generous profit-sharing program. And though both David and Chris have children who show promise as fourth-generation owners, they are not ruling out the possibility of broader ownership in the future.

When the Boss Won't Let Go

At Firm X, there is an employee of tremendous skill. He knows the firm's background and he has extensive contacts. But he takes exception to management or design decisions and lets everyone within earshot know it. He's a threat to efficiency and morale. He is, in fact, one of the firm's former principals who has retired from ownership with the agreement that he can continue to work part-time.

Almost everyone interviewed for this article advocated continued employment, on a full- or part-time basis, for former owners. But many also caution that keeping former principals on staff requires sensitive orchestration. People who have been at the top of the firm are so accustomed to a certain level of power and respect that becoming a mere member of the team can be traumatic. They may try arguments that used to be persuasive, and they may be shattered if they're overruled.

If retired owners are to work on staff, certain rules should be observed. Make sure the retired owner is comfortable with his or her buyout money and, conversely, that current principals don't resent the cost to them. Be sure that the firm's current structure gives one person—a president and/or CEO—the final word on all decisions, to defuse divide-and-conquer tactics. Make it clear to previous owners working in the firm that criticism of the firm's current management should be taken up with the boss, not aired with others.

Of course, there are owners who welcome the chance to retire, in some cases before they are 65. Sometimes they are wary of getting involved in the firm's liability suits, which could (depending on the firm's structure and on state laws) threaten their own resources. More commonly, such suits threaten the firm's reputation, making the owners' stock in it less valuable. And while the economy is good right now, it is also volatile. Some owners would rather bow out now, before another recession undermines the value of shares.

Who Pays?

Money for retirement may not ultimately be the most important concern in firm succession, but it is one that always presents a fundamental conflict. Principals giving up their ownership always want to be adequately compensated for it, while those buying in don't want to be unduly burdened. Professionals who may have had a mentoring relationship before are forced to become adversaries, assuming the uncomfortable roles of seller and buyer.

Some type of payment plan that compensates the departing owners without placing painful burdens on new principals must be devised. The most financially successful transitions are those in which the owners see their holdings not as assets they can cash in when they retire, but as an opportunity to have a say in directing the firm for all those years before retirement.

But ownership transition is the major way most departing principals fund their retirement. It is easy to see retirement as the reason a succession plan is needed, Lurie says, because senior partners who initiate the process are probably seeking an exit strategy. The attitude of the outgoing principals is crucial here. If there's greediness on any side, things can get bitter.

There are two common ways for incoming principals to buy out present owners: tapping their personal resources (second mortgages, loans, or other cash), or paying in installments that come from bonuses or profit-sharing. Much less frequent, but recommended by some, are two alternatives: present partners simply donate shares to younger members of the firm, or they establish a retirement fund, so that the firm as a whole contributes to the buyout, reducing the burden of the principals acquiring ownership.

The strict pay-for-your-own-shares policy works best if compensation for the incoming principals is generous. Paying out of bonuses usually means increasing the size of bonuses for those buying in. In one common scenario, all partners receive equal shares of the profit, but the junior ones pay back part, installments toward their ownership stake.

A retirement fund was established by one successful (hence valuable) firm when they realized that the buyout of the three founders, all of whom would retire about the same time, could not be comfortably achieved by conventional means. Money paid into the fund in monthly

Turnbull Griffin & Haesloop's transition would have been hard even under the best of circumstances. Matters were made worse when William Turnbull Jr., FAIA, died suddenly last year at the age of 62. His wife, Mary Griffin, AIA, who was president and CEO of San Francisco–based William Turnbull Associates, became the sole shareholder. That meant she suddenly had full responsibility for the firm's succession plan. Fortunately, enough thinking had been done that succession proceeded as smoothly as could be expected.

These were "tough emotional circumstances," says Lou Marines, president of the Advanced Management Institute for Architecture and Engineering, an educational and management consulting firm in San Francisco. While Turnbull had suffered a chronic illness, his death came unexpectedly. "We had done some prior planning in light of [Turnbull's] poor health, but we carried on with the great hope that this was going to be a conventional succession," Marines says. "There was an established framework, but the specifics were not in place."

Eric Haesloop, AIA, joined the firm about the same time as Griffin, almost 13 years ago. Griffin became a controlling shareholder in 1994 and was selected president and CEO in 1996. But all three principals shared leadership responsibilities, with each taking one third of the firm's business, which includes institutional and residential work. Within a few weeks of Turnbull's death, the firm changed its name to Turnbull Griffin & Haesloop—a move that had been planned before last summer—and Haesloop began the long process of buying ownership shares, paying for them out of his bonuses.

Some type of ownership role is important to establishing Haesloop's position with the firm and is a logical career move for him. "It is a reflection of how we had been working before Turnbull's death. Becoming an owner is part of a natural succession," Haesloop says.

The partners face a challenge similar to that confronted by their mentor in 1970, when Turnbull became sole owner of MLTW. Griffin and Haesloop must prove themselves without their partner. It's a scenario played out whenever a leadership transition occurs. Since Turnbull was active until just before his death, most of the work in progress bears his imprint. Reassuring clients that they will receive the same level of design service has been a top priority.



Eric Haesloop and Mary Griffin, CEO and president of Turnbull Griffin & Haesloop, continue the traditions established by William Turnbull.

Two associates, Andrew Mann and Susi Marzuola, have served as a secondary level of leadership, helping to keep work moving steadily while Haesloop and Griffin were forced to meet with lawyers, accountants, and consultants. "Just as these kinds of things bring a family closer together, we've found everyone here has contributed a lot and helped work through this," Haesloop says.

With both partners in their mid-40s, now is the time to look ahead to the next succession, even as Haesloop and Griffin continue to decide what kind of firm Turnbull Griffin & Haesloop will become.

installments has spread the burden over all aspects of the firm's operation. In recent years, the cost has hardly been felt, and the fund is growing nicely.

When a large majority of ownership has to be bought out, and the financial burden on incoming owners is daunting, it is tempting to expand the pie by pursuing strategies intended to expand revenues and make the buyout painless. The problem with such an approach, of course, is that business conditions and competitive forces can thwart even a well-considered expansion strategy. *The Complete Guide to Ownership Transition* (PSMJ Resources, 1996) is very blunt on this point: base buyout plans on actual revenues, not on the assumption that they may increase.

The easiest solution is to stretch payments out over a period of years. Or the firm may pursue more imaginative strategies, such as establishing a retirement fund or an employee stock ownership plan (ESOP). These profit-sharing plans invest in the stock of the employer rather than a diversified portfolio. ESOPs are recommended as a way to fund buyouts when large amounts of ownership have to be bought from retiring partners within a short period. Though few architecture firms have adopted ESOPs, they can be advantageous because the funds are also available for such purposes as purchasing equipment. Special tax provisions for ESOPs magnify these advantages. And with an ESOP comes the requirement for an annual valuation of the firm by an outside expert, which provides a useful index of its value.

Whatever type of plan is adopted, it is essential to involve key staff as planning proceeds. Firm members earmarked for ownership may find it difficult to buy their shares, whether by borrowing or paying for them out of future income, so it is essential to involve them in the planning process, not just offer them a take-it-or-leave-it deal.

MOST ARCHITECTS WANT THE ORGANIZATIONS THEY HAVE NURTURED TO GO ON LONG AFTER THEY'VE DEPARTED.

The Price of Perpetuity

How much effort should be invested in the firm's survival? Some star-designer firms seem to have no reason to exist without the stars, but most architects want the organizations they have nurtured to go on representing their intentions long after they have departed. A combination of personal ego, professional responsibility, and camaraderie with associates is involved. However long a firm survives, it will never stay the same. It will constantly evolve, quite possibly becoming an organization hardly recognizable to its founders. The cost of survival is often the transformation of a firm into an organization less daring and more businesslike. But while the surviving firms are more likely to become businesslike, the more businesslike firms are the most likely to survive. ■


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DETENTION FACILITIES

Locking Them Up

IS GETTING TOUGH THE BEST WAY TO APPROACH PRISON DESIGN? OR SHOULD FACILITIES RESPOND TO THE NEEDS OF THE POPULATIONS BEING DETAINED?



1

Kitchener, Ontario

The Canadian approach to corrections is highlighted in this facility where women detainees are prepared for reintegration with the rest of society.



2

SeaTac, Washington

Most federal prisons house offenders serving terms of 18 months or more, but this 10-story facility serves a range of more transient populations.



3

Charlotte, North Carolina

Designed with a civic presence for a downtown setting, this 1,000-bed county jail also provides outdoor recreational spaces for each housing pod.



4

Brooklyn, New York

Alleged offenders at this 124-bed city facility range in age from seven to 15. The goal is to use their time here as an opportunity for positive intervention.

James S. Russell, AIA



Politicians may be calling for more prisons that punish offenders at the lowest cost, but architects and facilities operators understand the need to tailor the approach to the population. The four projects featured in this Building Types Study address the needs of different kinds of detainees, from women with children to children themselves. The essay below considers the dilemmas of corrections design at its most vexatious: the world of juvenile offenders.

The Epidemic of Youth Violence," screams one headline. "Crime Time Bomb" cries another. "In a Dark Alley, Most Feared Face Is a Teen's" declares *USA Today*. Moral relativism and glamorization of violence, say pundits, have bred a new generation of teen "superpredators," a phenomenon whose lurid potential is gleefully seized on by sensation-hungry media. Out of this attention to juvenile crime has come legislative action mandating more jail-like facilities for juveniles, a reduction in rehabilitative programs, and the transfer of juvenile offenders to the adult courts and corrections systems.

Most people involved in juvenile justice believe that a significant percentage of youth offenders are capable of rehabilitation. Most designers see their chief role as making environments that encourage better behavior. Yet the political momentum toward harder facilities and more severe punishment is at odds with this consensus.

A bill now in Congress would relax federal restrictions on jailing juveniles with adult felons, and make some federal aid available only to states that prosecute violent juveniles age 15 or older as adults. It has yet to pass, but similar efforts have succeeded in the states. For architects, the dilemma is: should they design better kid warehouses, get out of the business, or help change the political climate? There are no easy answers.

Fear drives policy

John J. DiIulio Jr., the Princeton professor of politics and public affairs who coined the term "superpredator," calls those who think youth violence can only be averted by the threat of long, hard prison terms "dangerously deluded." Frightening trends, many of them highlighted by DiIulio himself, fuel the fear that youths are more violent and less capable of rehabilitation. Over the last 10 years the rate of juvenile arrests has

WHAT YOU MUST CONSIDER WHEN DESIGNING A JUVENILE FACILITY

Many clients say they want to do more with the design of juvenile detention facilities. Architects can help by creating facilities that reconcile staffing, programs, and other needs. What follows are some key design issues that architects must address.

Siting: The detention facility must be secure and project a sober institutional face to the community, yet it must not overtly advertise its function. High chain-link fences topped by razor wire are usually not acceptable in established communities and may fly in the face of regulations or corrections methodology. Many jurisdictions choose to site facilities in remote rural areas to lower costs and avoid neighborhood conflicts. These locations make family visits onerous (an important concern, especially for younger offenders), entail high inmate-transportation costs, and may offer a too-limited pool of talented specialized staff.

Hard or soft: In spite of the trend toward harder facilities, Essex County's Joseph Clark says, "You've got to make sure it is possible to have appropriate programs." Harder facilities are generally more expensive to build and operate, and not all facilities need to be heavily secured. "I would like the flexibility to house different behaviors," says Robert Murray, director of a Hudson County, New Jersey, jail. "Not all kids need two-inch-thick doors and very heavy furniture." In every facility, however, security comes first, not just to keep inmates in, but also to protect staff. Walls, doors, and gates control undesired movement but can impede the visual surveillance and communication needed to supervise and manage the facility. Excessively inconvenient security features may prompt staff to circumvent them, creating unintended problems. Higher levels of programs and higher security generally mean higher staffing. A facility will simply fail—become prone to violence and escapes—if necessary staffing levels are not funded.

Housing type: Most new facilities have moved to a "direct supervision" model, in which staff mingle with detainees within the housing unit and elsewhere. (Prisoners are observed from outside the secured unit in the "indirect" model, used in many adult prisons.) Though it would seem risky to expose guards directly to residents, supervisors placed in the housing units know better what is going on with inmates, can reach out to them, and can address problems before they get out of control. Total beds in a juvenile detention center are likely to be far fewer than in adult facilities. While as many as 40 adults may reside in a single unit, juvenile housing units usually have no more than 12 residents. Adult facilities often have little daylight and few design flourishes, but juvenile facilities may have residential-style amenities such as carpeting, sunlight, and a range of recreational offerings. "You are not going to lock up most of these kids for a long time," says architect Michael McMillen, "so you want a good response from them. You want to co-opt them, rewarding good behavior."

Programs: Most in-facility programs need to address small groups, for security reasons and to assist residents who often have major deficits in school and social skills. Regular programs may include mentoring, school (even a Graduate Equivalency Degree), drug treatment, psychotherapy, and religious services. "Our program may be the first time these kids have ever received individual attention," says Joseph Panepinto, principal of the Hudson County facility's school. The location of programs within facilities is key to security and operational efficiency. Centralized locations for education, dining, and other programs may offer efficiencies of scale but may also entail time-consuming and costly inmate movements. Many juvenile detention facilities house some programs in the housing units (or share them among two or more units), but this arrangement may stretch staff too thin or cost too much for duplicated spaces.

Durability: Building products and finishes suited to residential occupancies were acceptable in the days of less-confining facilities. Today operators seek a residential appearance, but also a level of durability that reflects lower maintenance budgets, as well as a population that is typically more aggressive and more suicide-prone. (With time on their hands, inmates can turn a sprinkler head, a light fixture, or any kind of hardware into a weapon.)

J.S.R.

risen, and the arrests are for more violent crimes. All arrests for murder and negligent manslaughter, for example, increased about 23 percent between 1985 and 1994, but the number of juveniles arrested for the same crimes went up by 150 percent, according to FBI figures. The percent of homicides committed by juveniles also increased rapidly in the '80s and early '90s, though it still represents only 10 percent of all murders. But from 1994 to 1996, the juvenile arrest rate declined by 12 percent. The recent declines have been variously attributed to crime-prevention efforts, a reduction in the availability of handguns, and the waning of the crack-cocaine epidemic. Complacency about juvenile crime, though, is risky, warns DiIulio. The number of teenagers will grow rapidly in the next few years, presumably pushing youth crime up as well.



Lookout Mountain in Golden, Colorado (Anderson Mason Dale and RNL Design, 1988), represents a model that is falling out of favor. Its residential character is meant to encourage good behavior among inmates.

Though only about 5 percent of all juvenile arrests are for violent crimes, it is this "small percentage of youth that is driving pubic policy," says Karen L. Chinn, of Chinn Planning, a consultant based in Columbia, South Carolina. Many state and local governments are building "harder" new facilities that are more secure and institutional in design, or requiring the transfer of juvenile offenders to adult courts (and thus prisons).

The great majority of juvenile arrests (2.7 million in 1994) are related to drugs or vandalism, or are "status offenses" such as truancy or running away from home. Chinn says drug treatment, education, and vocational training programs have high success rates for these offenders, but are often sacrificed in today's overheated political environment.

Locking kids up instead of finding other solutions

About 674,000 kids passed through juvenile facilities in 1993, but only about 60,000 were actually held. That number is growing rapidly, however, as is the number of beds. This is less because of a growth in convictions per se than because juveniles are now incarcerated for crimes that in the past would have resulted in probation or other punishment.

F. Jerald Adamek of the Colorado Division of Youth Corrections described the events that spurred $30 million worth of spending in his





The Hudson County (New Jersey) Detention Center offers some of the amenities of the less harsh "normative" model in a higher-security, more discipline-oriented facility. Design architect Ricci Associates worked with Dean Marchetto Associates.

system. Several terrifyingly violent crimes committed by teenagers in Colorado in 1992 became, in the media, a "summer of violence." After that, the system started adding beds, but demand surged ever higher: "Detentions went from an average of seven days to 18 days," recounted Adamek at a conference last spring sponsored by the AIA Architecture for Justice professional interest area. "Policy changes and mandatory sentences moved incarceration times from an average of two years to approaching five years. What were once misdemeanors became felonies," he says. As a result, a 600-bed system in 1991 will become a 2,200-bed system by 2004.

Juvenile facilities, because of their staffing needs and the intensity of their programs, are significantly more expensive to build and operate than adult facilities, which have, over the years, cut back on many rehabilitative programs. The average cost per bed to construct a juvenile detention center is $100,000 to $150,000, says Chinn. Operating costs are equally daunting at $150 to $200 per day. (The upper range is more than double what it costs to house a typical adult prisoner.)

ONLY ABOUT 5 PERCENT OF JUVENILE ARRESTS ARE FOR VIOLENT CRIMES, BUT IT IS THIS SMALL GROUP THAT IS DRIVING PUBLIC POLICY.

Changing roles for the justice system

Juvenile facilities design is changing because the perception of what the justice system is supposed to accomplish is changing. From the 1970s to the late 1980s, a "normative" model prevailed, emphasizing behavior modification in noninstitutional settings that had a minimum of the visible apparatus of security or confinement. Projects built according to these tenets respected privacy and individuality through varying architectural finishes, movable furniture, generous use of daylight, and a great deal of interaction with staff, who could encourage residents while controlling them.

This model, though successful in some jurisdictions—such as Colorado's Lookout Mountain facility, designed by Anderson Mason Dale and RNL Design and completed in 1988—has been overwhelmed by political reality. The growth in offenders, the lengthening of sentences, and the reduction in judicial discretion over the past few years have made this model a luxury fewer jurisdictions can afford.

Joseph Louis Clark, who directs a new juvenile detention facility in Essex County, New Jersey, that serves Newark, which is among America's poorest and most crime-ridden cities, has returned to the "custodial" model. "This is a secured, locked-down jail," he says, and the brooding red-brick exterior of this one-year-old facility, with its chunky massing and slitlike windows surrounded by a high, barbed-wire-encrusted fence, leaves no doubt. He thinks cities like his need more youth jails. (Clark, once a high-school principal, was immortalized as a baseball-bat-wielding protector of youth in the movie *Lean on Me*. He took over the Essex County juvenile justice program four years ago.)

Given a population that comes largely from what Clark calls environments of "hopelessness and despair" that "lure young people into lives of criminality," he disparages the usefulness of the behavior-modification model. The design of the housing units at the Essex County facility reflects this perspective. On each of three floors, four 16-room units fan out around a glass-enclosed central control room. Furniture is fixed; floors are vinyl tile; lights are fluorescent. The rooms have toilets and sinks of standard prison type. But Clark has also developed a 300-person mentoring program and involves 35 churches to encourage a grounding of character through spirituality.

Clark's approach resembles the military model promoted by advocates of "boot camps" in which inmates are subjected to military-style discipline, sometimes humiliating, sometimes physical. These programs and lock-down-type facilities have been politically popular with a public fearful of parole and halfway houses. But can such approaches be credited with recent drops in the crime rate? This question elicited a room-wide groan at last spring's juvenile justice conference. "No data support this," says James R. Bell, staff *(continued on page 151)*



Get-tough politicians argue for higher-security jails for juveniles, such as this recently completed facility for Essex County, New Jersey.

1 Grand Valley Institution for Women Kitchener, Ontario

MODELED ON THE IDEA OF A VILLAGE, THIS WOMEN'S PRISON PROVIDES VARYING LEVELS OF SECURITY IN A NONINSTITUTIONAL SETTING.

by Beth Kapusta

Project: *Grand Valley Institution for Women, Kitchener, Ontario*
Client: *Public Works Canada, Correctional Service*
Architect: *Kuwabara Payne McKenna Blumberg Architects—Marianne McKenna, partner-in-charge; Bruce Kuwabara, Robert Sims, project architects; John Allen, site architect; Howard Sutcliffe, David Pontarini, project team*
Engineers: *Read Jones Christoffersen (structural); Crossey Engineering (mechanical/electrical)*
Landscape Architect: *Milus Bollenberghe Topps & Watchorn*
General Contractor: *G. W. Harkness Contracting*

Size: *74,730 square feet for main building, 1,800 square feet for each of 10 houses*
Number of beds: *80*
Construction cost: *$9.4 million*

Both critics and supporters of the Grand Valley Institution for Women agree on one point: it feels more like a community center than a jail. This relatively casual atmosphere is the result of two decades of studies by the Canadian government, which revealed what many corrections workers knew intuitively: the old methods of incarceration weren't working, especially for women.

Before Grand Valley was built, all federally sentenced women with terms of two years or more were sent to a central maximum-security facility in Kingston, Ontario, a complex too inflexible to accommodate inmates with lesser security needs. Geographic dislocation was a particular hardship for the 40 percent of incarcerated women caring for children, and reintegration into society often proved very difficult.

A 1990 government report entitled "Creating Choices" led to something of a minor revolution in thinking about prisons and to a radical shift in the architecture of women's prisons. Grand Valley, designed by Kuwabara Payne McKenna Blumberg Architects, is one of five regional centers built to replace Kingston's centralized facility. The new prison is just outside Kitchener, a small southern Ontario city selected for its strong local industry and numerous community colleges, which facilitate outreach and work programs that act as transitional steps back to society.

Loosely modeled on the layout of a village, the institution comprises 10 "houses" surrounding a green, with all of the shared and administrative services located in a long wing to the east. Even here, the institutional character is played down by the articulation of the various programmatic elements—administration, visitation, casework, gymnasium, education, and health care—into separate volumes joined by a loggia facing the common. Rather than radiating from a central surveillance tower, Grand Valley has at its core a cylindrical structure that serves as a nondenominational chapel.

While the prison's perimeter wall is solid, almost monolithic, to reinforce the notion of security, its highly transparent inner skin gives the complex an architectural quality. Light-filled corridors stepping down to match the sloped grounds create an attractive common realm. Subdued colors, natural maple millwork, and indirect lighting reinforce the noninstitutional character. Particularly successful are the entrance sequence and the visiting area, a lofty pavilion supported by tall, exposed steel columns with branch-like capitals.

To encourage self-sufficiency



PHOTOGRAPHY © STEVEN EVANS

Beth Kapusta writes about architecture and teaches at the University of Toronto School of Architecture.



The main building (above) has offices, a gym, vocational training rooms, health-care facilities, and a "spirituality room" (left in photo below). Women live in 10 houses grouped around a green (opposite).







To help inmates prepare for their return to society, the prison has spaces for education (right) and casual interaction (above).

and make their eventual transition back into society smoother, the women live in houses, each of which accommodates a maximum of eight people.

The sloped-roof cottages offer a progression of spaces from the most public (porch, living, dining, kitchen) to more private areas (laundry, study, bathroom) and finally to the most private (four bedrooms on two levels). Instead of one large cafeteria, each house at Grand Valley is responsible for ordering and cooking its own food. The well-maintained gardens in front of the houses reflect a palpable pride of place, an indication that the inmates appreciate the responsibilities offered them.

Though all 10 houses appear similar, they accommodate varying levels of security; the maximum-security house, for example, has an enclosed walking yard. Another house is for women who have children.

According to George Centen, acting director of facility planning and standards for Correctional Services Canada, the cost per unit for this type of prison is one-third to one-half that of traditional penitentiary construction. Maintenance costs are also greatly reduced, as the sense of ownership and responsibility instilled by this model results in less vandalism and damage. And the simple wood-frame construction is much easier to alter than traditional concrete prisons. Although it is too early to document the effect of the new prison model on recidivism rates, anecdotal evidence from both inmates and staff indicates that the more humane environment has a calming effect. "The public is best served if we can assist in making better people when they return to society," observed Centen.

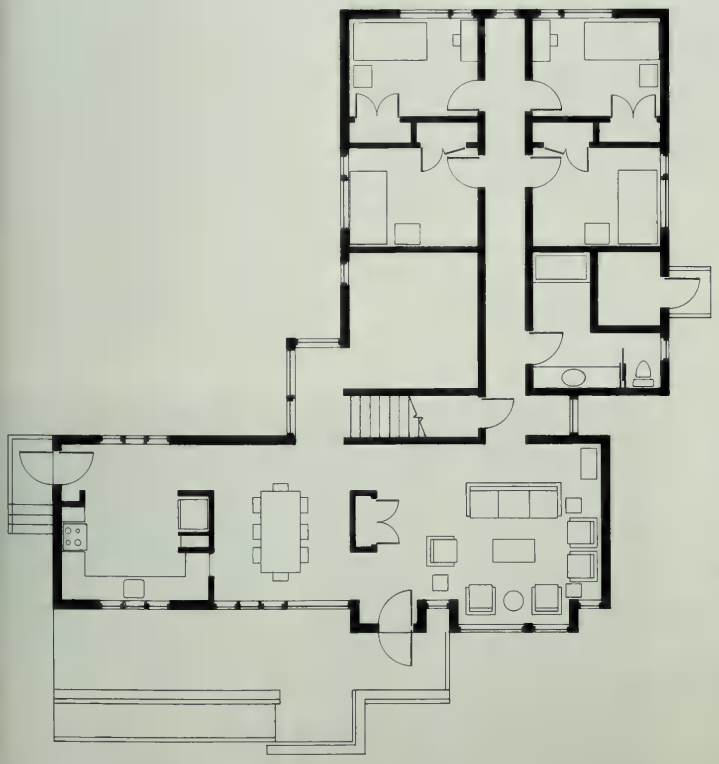
Some of the initial idealism, though, has been tempered since the start of the project. The notion of replacing fences with electronic security devices, for instance, was abandoned in the face of public fears that prisoners were insufficiently confined. Barbed wire was also added at the front to reinforce the appearance of security, even though the building's public face acts as a secure perimeter.

Yet the humanist aspirations of this project remain powerful. Like the facility's staff, Marianne McKenna, the partner-in-charge, is committed to the idea that good design can help create a prison that rehabilitates, not just incarcerates. ■

Sources
Steel frame: *Nu-Arch Steel*
Aluminum curtain wall: *Sherwood Industries*
EIFS: *Durock*
Rigid roof insulation: *Dow Chemical*
Security hardware: *Von Duprin, Rutherford, Locknetics*

Each of the 10 houses accommodates eight inmates. Women take responsibility for everyday chores such as doing their laundry and ordering and cooking food. Front porches reinforce the residential feeling of the facility (right).





RESIDENTIAL COTTAGE FIRST FLOOR



SECOND FLOOR

0 10 FT.
3 M.

2 Federal Detention Center SeaTac, Washington

NBBJ WRESTLES WITH THE CHALLENGE OF DESIGNING A HIGH-RISE FEDERAL PRISON IN A MAJOR METROPOLITAN AREA.

by Barbara A. Nadel, AIA

Project: *Federal Detention Center, SeaTac, Washington*
Client: *Federal Bureau of Prisons*
Architect: *NBBJ—James Jonassen, FAIA, partner-in-charge; Richard Dallam, AIA, design principal; Steve McConnell, AIA, senior project designer; Leigh Sutphin, project manager; Gary Edmonds, technical designer; Niranjan Benegal, project planner; Bruce Bonine, AIA, medical planner; John Adkins, AIA, Steve Bettge, John Christiansen, Tessie Dantes-Era, Budy Djunaedi, Bob Dooley, Becca Dudley, Ken Eckert, Laurance Glasser, Kristine Gormley, Jay Halleran, Gretchen Harriott, Connie Halloway, Ralph Jorgenson, AIA, Dave Leptich, AIA, Bing Lin, John Palewicz, Mike Rogers, Derek Ryan, Andrew Smith, Daniel Smith, Ed Storer, Rysia Suchecka, Vince Vergel De Dios, Karen Wiram, designers*
Engineers: *Andersen Bjornstad Kane Jacobs (structural); Anne Symonds Associates (civil); CBGKL (mechanical/electrical)*
Construction Manager: *Heery International*
General Contractor: *M. A. Mortenson*

Size: *355,000 square feet*
Number of beds: *1,013*
Construction cost: *$63 million*

From Seattle to New York City, new detention facilities are emerging on the urban landscape, one product of legislative and popular mandates for longer sentences for criminals. The limited availability of sites and the need to be close to courts, transportation, workers, and inmates' families often mean that metropolitan facilities must be located in established neighborhoods.

While communities often resist attempts to locate prisons in their backyards, the jobs, contracts, and tax revenues generated by these projects can be attractive. And architecture can play a key role in making prisons good neighbors. Balancing costs, the needs of security, and community concerns remains a major challenge for architects and their clients.

The Federal Bureau of Prisons (BOP) operates 93 institutions housing over 108,000 inmates. While most prisons house inmates sentenced to 18 months or more, the Federal Detention Center at SeaTac International Airport serves a more transient population: those awaiting trial at the Tacoma or Seattle federal courthouses; convicted criminals awaiting transfer to other federal prisons; illegal aliens awaiting deportation; and a work cadre of short-term minimum-security inmates performing maintenance chores. The facility is also the western hub for the U.S. Marshals air transportation service ("Con Air"), which moves up to 120 detainees each week.

Barbara A. Nadel, AIA, is principal of Barbara Nadel Architect and specializes in criminal justice and institutional work.

The detention center is located on a 6.86-acre site on a hillside adjacent to SeaTac Airport, amid industrial buildings and single-family homes. Because of the steeply sloping site, motorists on busy Pacific Highway South can't see the 10-story, 355,000-square-foot tower a few blocks to the west.

Establishing a civic image for the building and a secure, federal presence within a neighborhood context were among the primary design objectives, says Steve McConnell, AIA, a principal at NBBJ. "The project team wanted the building's scale, form, materials, and detailing to articulate durability and the prudent use of public funds."

The building's exterior envelope is the primary security element. Closed-circuit television and motion detectors monitor the building exterior, rendering perimeter fencing unnecessary.

"Our neighbors are pleased with this facility because it looks like a modern office building, not a prison," observes Warden Bill Perrill.

The $63 million complex comprises a four-story cylindrical base and three six-story towers of male and female housing units and offices. The base includes administration, public spaces, and inmate services. The towers are set back from the main entry, minimizing visual contact between inmates and the public.





Three triangular housing towers sit above a circular base with public spaces and administrative functions (left). Dayrooms in the center of each housing unit allow for direct supervision of inmates by corrections officers (plans below).

Designing a high-rise prison for an urban area was made more challenging by the need to monitor daily inmate transfers while also separating inmates, staff, and visitors, says Mitch Miskimins, AIA, BOP project administrator. Three separate entries clarify circulation: a vehicular sally port for the marshals and a service entry (both below grade), and a public entry for staff and visitors.

The number of cells (502), types of housing units, and number of beds per unit were specified by the BOP. Double bunking expands capacity to 1,013 beds, allowing flexibility for population spikes. Stacking functions vertically posed design and operational challenges, says Niranjan Benegal, project planner for NBBJ. Due to a small footprint, housing units are on separate floors from program spaces, multipurpose rooms, and education areas—requiring inmates to move around more than in other facilities. Outdoor recreation areas, though, are directly adjacent to each housing unit. ■

Sources

Concrete masonry units: *Eastside Block*
Steel doors: *Habersham*
Hardware: *Folger, Adams*
Acoustical ceilings and resilient flooring: *Armstrong*
Elevators: *Montgomery-KONE*

1. *Entry*
2. *Reception*
3. *Control room*
4. *Education*
5. *Health services*
6. *Food services*
7. *Sally port*
8. *Offices*
9. *Outdoor recreation*
10. *Housing unit*
11. *Activity room*
12. *Inmate room*

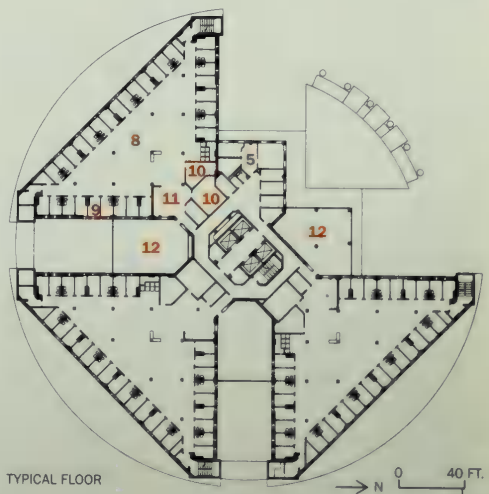


NORTHEAST-SOUTHWEST SECTION

0 40 FT.
12 M.



FIRST FLOOR



TYPICAL FLOOR

N 0 40 FT.
12 M.

1. *Entry*
2. *Control center*
3. *Visiting*
4. *Staff*
5. *Office*
6. *Education*
7. *Hearing room*
8. *Dayroom*
9. *Inmate room*
10. *Activity room*
11. *Food preparation*
12. *Outdoor recreation*

3 Mecklenburg County Jail Central Charlotte, North Carolina

TO DEAL WITH THE PROBLEM OF OVERCROWDING, THIS COUNTY JAIL WAS DESIGNED TO PROCESS DETAINEES AS EFFICIENTLY AS POSSIBLE.

by Charles Linn, AIA

Project: *Mecklenburg County Jail Central, Charlotte, North Carolina*
Owner: *Mecklenburg County*
Architects: *Little/HOK Joint Venture Architects*
Little and Associates Architects—Philip Kuttner, AIA, principal-in-charge; James Metze, AIA, project manager; David Malushizky, AIA, project architect; Alan Pettigrew, construction administrator
Hellmuth, Obata + Kassabaum—James Kessler, AIA, principal designer; Robert Karamitsos, project architect; Duncan Lyons, project designer; Anhtan Le, designer; Scott Hemlock, AIA, architect; Julie Steele, designer; Suzette Goldstein, urban planner; Jon Pearson, landscape architect; Spencer Poon, graphic designer; Amy Coe, interior designer
Engineers: *Restl Designers (structural); HOK Engineers (mechanical/electrical/plumbing); GNA Design Associates (civil)*
Consultants: *Kimme & Associates (master planners/programmers); Law & Policy Associates (systems analysts); LTS Consulting Engineers (electronic security); Foodesign Associates (food service); Hanscomb Associates (cost); F. N. Thompson/Turner (construction manager)*
General Contractor: *Metric Construction*

Size: *423,000 square feet*
Number of beds: *1,004*
Construction cost: *$58 million*

The past few years have seen major growth in Mecklenburg County, North Carolina. The population has risen from 511,000 in 1990 to approximately 550,000 today, with an additional 5.5 million people living within a two-hour drive of Charlotte, the county seat. As in other geographic areas where population becomes quickly concentrated, crime in the county has increased from 40,000 arrests in 1991 to about 60,000 in 1997.

In dealing with this increase in potential prisoners, Mecklenburg County worked with a simple idea to keep the population of its new Jail Central low: move people through as quickly as possible. Everything needed to complete the release of a person accused of a crime was put within easy reach. Those who can post bond, pay a fine, or be released on their own recognizance get out quickly, so the jail does not fill up. Police can drop off arrestees, complete paperwork, and be back on patrol with little delay. "Fifty percent of those arrested are out within 24 to 48 hours," says James Kessler, AIA, the jail's principal designer.

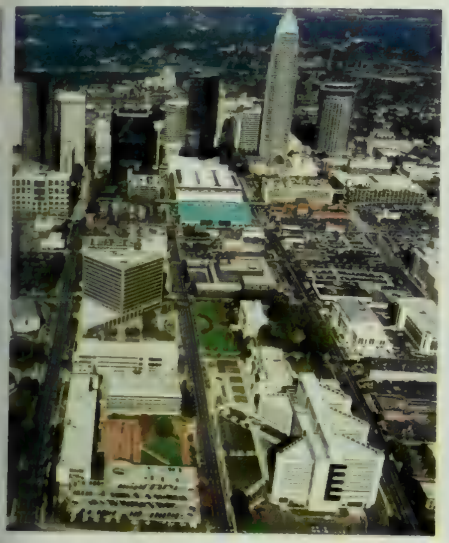
Efficiency was also one of the key considerations in siting Jail Central in downtown Charlotte, next to the courthouse and a city and county government building. (An obsolete 350-bed, 1970s-era jail was demolished in phases to make room for the new facility.) The proximity to other government facilities is important: the less the prisoners have to be moved, the lower the operational costs. And because many of the county's arrests take place in downtown Charlotte, a central jail made good sense.

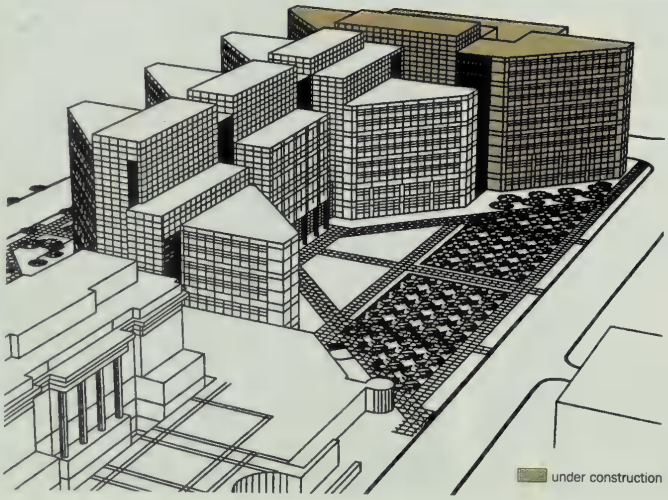
But as plans for the jail were being developed, citizens expressed concern. They worried that a large jail might counteract the hard work they had put in to maintain the economic vitality of downtown Charlotte. In addressing these concerns, the architects knew that the building had to convey an appropriate message. "No one who works or lives nearby needs to have lessons about the strength of justice embodied in a massive building in their neighborhood," says Kessler. "But a jail should be part of the community that creates it; it shouldn't be hidden."

To design a building that projected a dignified image without looking like a fortress, the architects used the unusual triangular floor plate of the adjacent government office building as a starting point. They developed the jail's plan as a series of triangular, direct-supervision pods organized along a circulation spine. Setbacks on both major elevations break up the facade and prevent the building from appearing monolithic.

As in most detention facilities, arrestees at Jail Central are moved from police cars and into the building out of public view. In the main lobby's glass entry, though, Jail Central feels like a safe, public building. A special emphasis was placed on making the layout of the building comprehensible through signage. "We want people to feel







The triangular blocks of the new jail relate to the floor plate of a city and county office building across the street (far left). Ground has just been broken for a new wing of the jail (far right in axonometric). The jail's public entry (below) and its relationship to the existing courthouse give the structure a prominent civic presence in downtown Charlotte.





Everyone being held at Jail Central sits together in airport-style seating (right) in full view of corrections officers. Detainees wait here while identification and records research take place to determine whether they will be released or taken into custody. This system helps keep as few people as possible from actually entering the jail system. The light-filled public lobby (below) is meant to give the facility a less oppressive feel.



that safety and professionalism reside here," says Kessler.

Everyone arrested in the county is booked at Jail Central, unless they are injured, in which case they are booked at the hospital. This eliminates the wasted time and personnel redundancies that occur when booking is spread over many locations. After being searched and given physical examinations, the accused are seated in an open waiting area while their identification is being established and their criminal records are being researched. The process allows the staff to classify detainees and determine whether they are of danger to themselves or to others.

There are areas here for magistrates, court-appointed defense counsel, and district attorneys. If negotiations for release on bond or recognizance are successful, or if charges are dismissed, the detainee is released. If not, the accused person is bound over for arraignment or trial.

Prisoners are placed in one of two types of security pods: those with "wet cells" and those with "dry cells." Detainees who are new to the prison system or who are in maximum security go to wet cells, which are equipped with their own plumbing. General-population prisoners go to dry cells and use common toilet facilities, a system that is much cheaper to construct.



Security pods consist of a central dayroom lined with cells. All of the cells at the facility are single-occupancy; some pods have cells with their own plumbing, while others have less expensive cells with no plumbing.



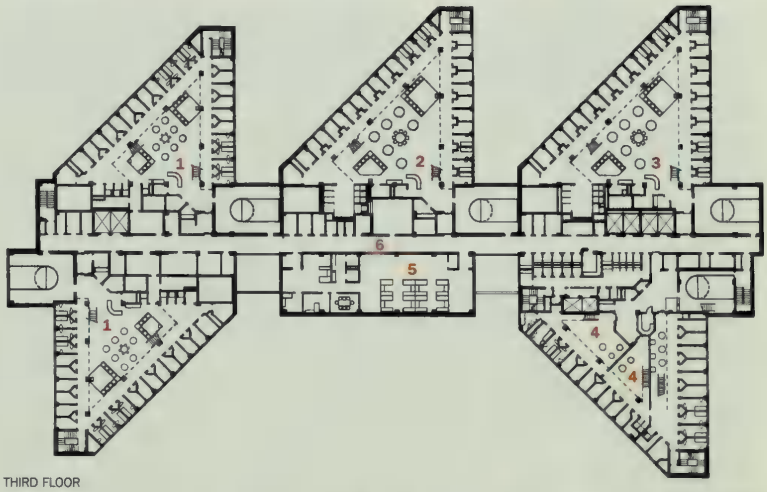
Direct-supervision detention was chosen for the Jail Central facility. Officers work alongside prisoners in large, open dayrooms; prisoners can move about freely between these rooms and their cells, which are located nearby. This creates an environment where detainees feel they are safe, says Kessler, and where "security is maintained with the least amount of force."

Because privacy is considered a key element in preventing trouble within a detention facility, the architects agreed with Jail Central's citizens' advisory committee to take the unusual step of making all the cells single-occupancy. "Operating costs are lowest when both detainees and staff feel the least amount of stress," says Kessler. "That's what we've tried to accomplish here." ■

Sources

Curtain walls and entrances: *Vistawall*
EIFS: *Dryvit*
Elastomeric roofing: *Johns Manville*
Steel windows, special doors, and security devices: *Norment*
Glazing: *LOF, Viracon*
Wood doors: *Weyerhaeuser*
Hardware: *Corbin, Hagar, LCN, Yale, Von Duprin*
Lighting: *Failsafe, Vista, Louis Poulsen, Halo, Sterner*
Lighting controls: *Microlite*
Elevators: *Otis*

1. *Male intake/ classification pod*
2. *Male trusty pod*
3. *Female general-population pod*
4. *Special needs pod*
5. *Classification office*
6. *Circulation spine*
7. *Intake administration offices*
8. *Magistrates*
9. *Waiting area*
10. *Pretrial area*
11. *Property storage*
12. *Staff lockers*
13. *Arrest-processing/ public entry*
14. *Main entry/lobby*
15. *Staff dining*
16. *Administration area*





4 Crossroads Juvenile Center Brooklyn, New York

A NEW SECURE-DETENTION FACILITY BY KAPLAN McLAUGHLIN DIAZ AND KARLSBERGER AIMS TO GET YOUNG OFFENDERS ON THE RIGHT TRACK.

by Barbara A. Nadel, AIA

Project: *Crossroads Juvenile Detention Center, Brooklyn, New York*
Client: *Department of Design and Construction, New York City*
Architect: *Kaplan McLaughlin Diaz—David Hobstetter, AIA, principal and design director; Robert Fierro, project manager and construction administrator*
Associate Architect: *Karlsberger Architecture*
Engineers: *DeSimone Chaplin + Associates (structural); Syska + Hennessey (mechanical/electrical)*
Consultants: *Maurice Wrangell (landscaping); ESA (security)*
Artists: *Carlton Ingelton (lobby); Willie Birch (courtyard)*
Construction Manager: *CRSS*
General Contractor: *Monarios Contracting Company*

Size: *114,500 square feet*
Number of beds: *124*
Construction cost: *$24 million*

The time a juvenile offender spends in secure detention—between arrest and adjudication—is an opportunity for positive intervention in his or her life. The Crossroads Juvenile Center, a 114,500-square-foot, $24 million facility run by the New York City Department of Juvenile Justice (DJJ), was designed to take advantage of this chance for guidance and rehabilitation.

The center houses alleged juvenile offenders aged seven to 15 while their cases are pending and, after sentencing, while they await transfer to state facilities. In 1998, 37 percent of the residents stayed three days; 58 percent were out in 10 days; the rest remained for weeks or months.

Crossroads' temporary residents are encouraged to rehabilitate themselves before becoming further enmeshed in the criminal justice system; the DJJ offers counseling as well as discipline, which is often lacking in their lives. "Aftercare," a voluntary program, provides continued support services—counseling, advocacy, educational monitoring—to youth returning to the community after detention.

In 1985, the city authorized replacement of the 289-bed Spofford Juvenile Center—built in 1957 as a home for runaway boys—with two new 124-bed secure detention facilities, in Brooklyn and the Bronx. The politically charged site-selection and approval process took four years. Planning began in 1989, construction started in 1993, and both facilities opened in 1998.

"The Brooklyn community was apprehensive," recalls DJJ Commissioner Tino Hernandez. "We met regularly with neighborhood leaders. The [finished] facility looks like a community center, has a meeting room for public use, and fits in well with the rest of the neighborhood."

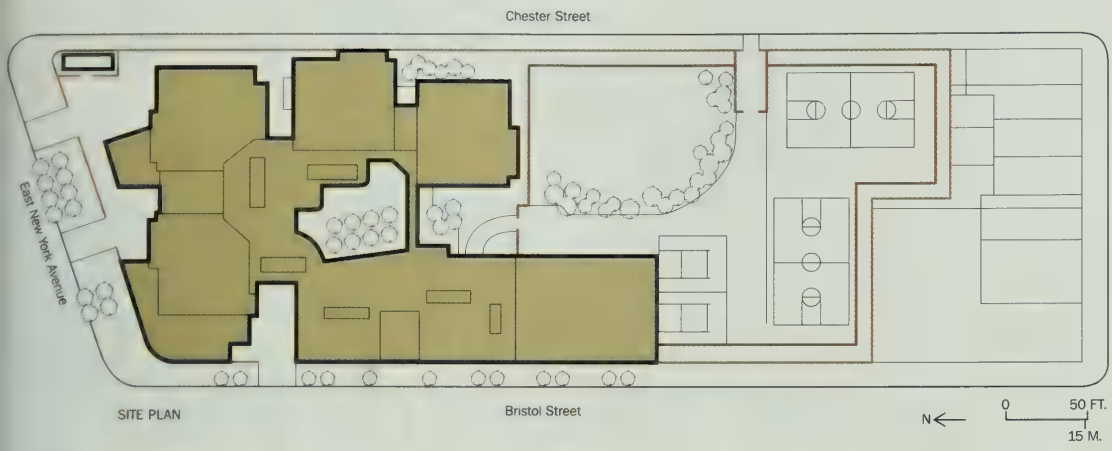
Located in Brooklyn's Brownsville section, the juvenile detention center has projecting cornices that evoke the classic silhouette of New York brownstones, while its precast panels contrast with the neighborhood's aging commercial, industrial, and residential buildings. Across the street, the blank brick wall of the local police precinct faces the center's modestly scaled sidewalk entry.

"The challenge was to create a normalized environment to rehabilitate kids, not a lock-up facility," says David Hobstetter, AIA, the Kaplan McLaughlin Diaz (KMD) principal in charge of the project. "Housing units, or pods, are designed as small residential neighborhoods," he adds.

Pods consist of either eight or 16 single bedrooms, allowing flexibility for accommodating girls or boys. Each pod includes private, rather than communal, toilets, counselor offices, and an enclosed outdoor recreation space. Gypsum board, not concrete-block, walls are used throughout the facility, and the pods feature commercial finishes, soffitted ceilings, and skylights—elements of an environment that is intended to have a positive effect on juvenile behavior.

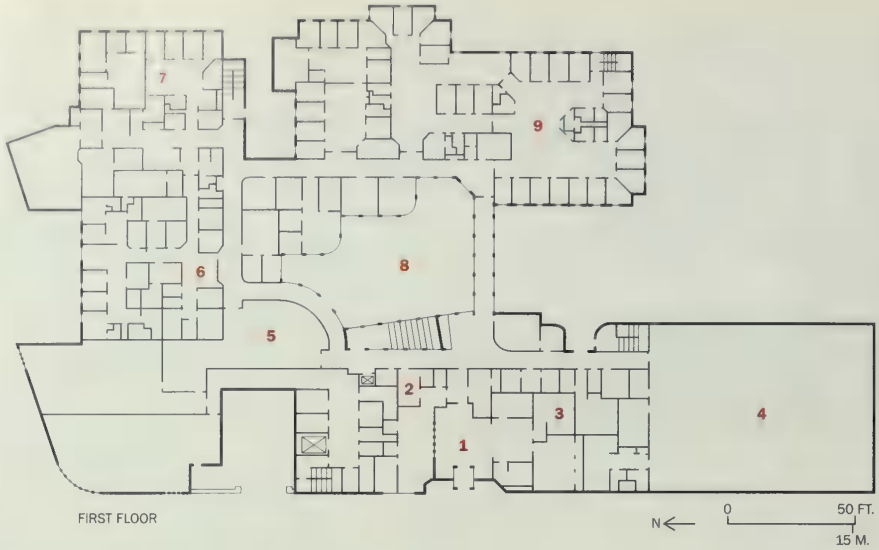
A central outdoor courtyard, paved with terrazzo mosaics designed by a local artist, is an





SITE PLAN

A masonry street wall helps connect the facility to its neighborhood (below). To protect the identity of juveniles, the building offers few views inside but many outdoor spaces within its walls (opposite).



1. *Entrance*
2. *Visiting room*
3. *Staff*
4. *Recreation*
5. *Food service*
6. *Medical*
7. *Intake*
8. *Courtyard*
9. *Short-term housing*





Incandescent lighting, along with [illegible] ceilings, warm colors, and wood trim (above and top), gives the facility a residential feeling that supports its mission as a place to help rehabilitate young offenders before they get more deeply involved in crime.

organizing element visible from many areas inside the facility. The building's spacious public areas receive plenty of daylight and provide clear sight lines for supervision.

To prevent visual contact with the public, street-facing windows are frosted. Windows overlooking the interior courtyard and the light-filled two-story main entry hall, though, are transparent.

Wall-mounted sconces and indirect lighting, instead of fluorescent ceiling fixtures, illuminate corridors and activity areas. The palette of warm, natural colors and noninstitutional finishes, fabrics, furniture, and wood trim all reinforce the facility's residential feeling.

Recreation spaces within the complex include landscaped socializing areas, handball and basketball courts, play structures, and a gym. An "elite lounge," reserved for residents exhibiting good behavior, is available for cooking, crafts, and learning new skills.

The facility is monitored by closed-circuit television from a central control room near the entrance. Counselors, wearing individual duress alarms, work closely with residents; roving officers are unnecessary. By law, one counselor is provided for every eight residents.

"The public wants to treat juvenile offenders as adults," observes Peter Krasnow, AIA, KMD's director of justice facilities. "Yet the client users we work with believe that kids can change their behavior in a normalized environment within the security envelope. Our challenge is to balance the call for harsh lockups by the public, politicians, and contracting agencies with the rehabilitation staff's request for user-friendly, manageable environments."

Next spring, the DJJ and KMD will complete a postoccupancy evaluation to see if the facility is working as intended and if the softer environment is appropriate for more secure housing units planned for the site.

From its experience at Crossroads, the DJJ has identified key steps for a successful juvenile detention project: work with the community early on so it is supportive, not frightened; involve staff during the planning process; design in flexibility for male or female housing; test materials for durability; and locate offices within the housing pods to provide greater interaction between the staff and the residents. ■

Sources

GFRC and precast concrete: *GFRC Cladding Systems*
Security steel windows: *William Bayley Company*
Security glazing: *GE*
Security sliding doors: *Folger Adam*
Acoustical ceilings and resilient flooring: *Armstrong*



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PRODUCT REPORTS...

This year, a panel of five judges gathered at our offices to select the best products for ARCHITECTURAL RECORD*'s Product Reports 1998. Steven Goss, AIA, from HLM Design (formerly JPJ Architects) in Dallas; Sandra Leibowitz from Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C.; Robert Siegel from Garrison Siegel in New York City; Dan Himmelberg, AIA, from Gould Evans Affiliates in Kansas City, Missouri; and Berni Hui from Gensler in New York City spent a full (and intense) day sifting through piles of product literature, information, drawings, and photographs. From the more than 500 products submitted, 101 were chosen for publication because of their high level of innovation or improvement in three areas: performance, appearance, and value. The judges agreed that these new and noteworthy products would meet the needs of their peers, our readers.*

The panel of judges found that the most dramatic product innovations were in the area of technology. Two- and three-dimensional imaging and rendering programs, real-time document sharing, design software packages, and wireless communication devices were just some of the products that incorporated new technologies for design professionals.

But even though the industry is moving toward a high-tech future, the judges also found much to admire in improved building materials, both traditional and new. They chose products that have revived interest in brick, metal, wood, plastic, and concrete. They were particularly impressed, for instance, with concrete-form liners that produce walls with a three-dimensional texture and deep shadows.

One of the judges, Robert Siegel, summarized the panel's overall feelings on the technology trend and how manufacturers of traditional building products are keeping up: "Computer applications allow for a rationalized, quantitative analysis of a building," he said. "They are effective tools, but cannot substitute for human knowledge and intuition." With this in mind, the panel chose a variety of product literature on paper and CD-ROM that documents building products and installation procedures.

Also included as part of Product Reports 1998 is the Readers' Choice Awards. This year, we tallied the winners from ballot forms that were mailed, faxed, and E-mailed to our office, grouping the winners by individual product categories. They are presented on page 91.

We want to thank the five judges on our panel, the readers who filled out Readers' Choice surveys, and the manufacturers who submitted products for consideration. We look forward to reviewing next year's submissions. —Elana Frankel

94 General Data
97 Site Work
99 Concrete
101 Masonry
103 Metals
104 Woods & Plastics
106 Thermal & Moisture
109 Doors & Windows
112 Finishes
117 Specialties
119 Equipment
120 Furnishings
122 Special Construction
123 Conveying Systems
125 Mechanical
127 Electrical



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READERS' CHOICE Winners

ARCHITECTURAL RECORD's 1998 Readers' Choice Awards recognize manufacturers whose products contribute to the success of architectural projects. Using a survey circulated in the August issue, readers nominated manufacturers based on their product's design, cost, and value as well as the company's level of customer service. The companies that received the most votes in each of 33 CSI categories are presented below.



ALUCOBOND
Exterior Cladding/Commercial
800/626-3365

AMERICAN OLEAN
Tile
800/933-TILE

APPLE
Computer Hardware
888/275-8258

ARMSTRONG
Commercial Ceiling Treatment
Resilient Flooring
800/448-1405

AUTOCAD
CAD Software
800/225-1076

BELDEN BRICK
Masonry Units
330/456-0031

CARLISLE
Roofing System/Commercial (tie)
800/338-8701

GAF
Roofing System/Residential
800/766-3411

HEWLETT-PACKARD
Computer Peripheral
800/851-1170

JOHNS MANVILLE
Roofing System/Commercial (tie)
800/654-3103

JULIUS BLUM
Architectural Metalwork
800/526-6293

KAWNEER
Entrance System/Commercial
Window System/Commercial
770/449-5555

KIM
Exterior Lighting Fixtures
818/968-5666

KOHLER
Plumbing Fittings or Fixtures
888/361-8000

LARSENS
Fire Protection Specialties
800/527-7367

LEVOLOR
Blinds, Shades, Shutters
800/826-8021

LIGHTOLIER
Interior Lighting Fixtures
800/215-1068

LM SCOFIELD
Concrete Material
800/800-9900

MARVIN
Exterior Door/Residential
888/537-8269

MICROSOFT
Practice Software
425/882-8080

OTIS
Elevators
860/676-5481

OWENS CORNING
Building Insulation
419/248-8000

PELLA
Window/Residential
800/54-PELLA

PPG
Architectural Glazing Products
412/434-2329

SCHLAGE
Door Hardware
800/847-1864

SHAW
Carpet/Commercial
706/278-3812

SMITH & HAWKEN
Site Furnishings
415/389-8300

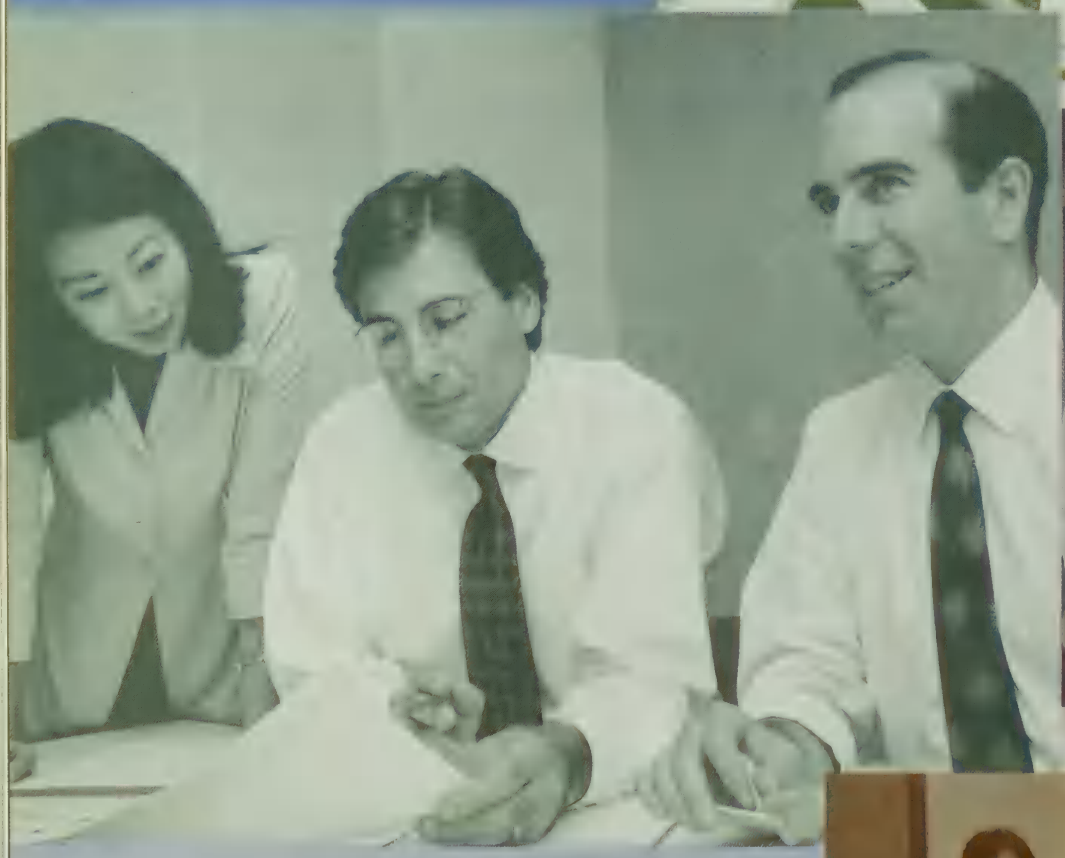
TRUS JOIST MACMILLAN
Engineered Wood Products
800/628-3997

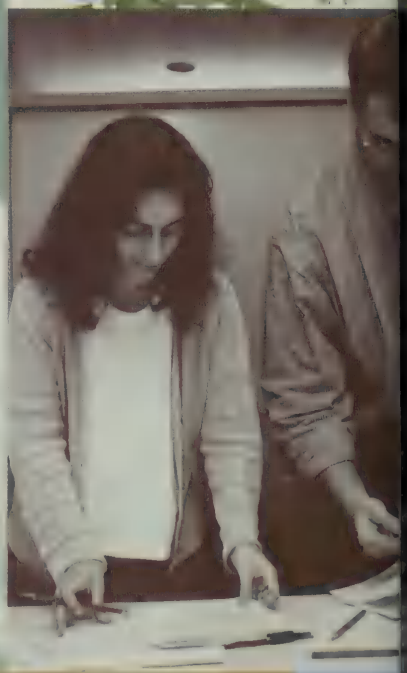
WEYERHAEUSER
Interior Door/Commercial
Interior Door/Residential
800/869-3667

WOLVERINE
Exterior Cladding/Residential
800/521-9020











This year's panel of judges included (middle photos, left to right) Berni Hui, Steven Goss, AIA, Robert Siegel, Sandra Leibowitz, and Dan Himmelberg, AIA. Each panel member brought his or her own area of architectural expertise to the judging and a personal understanding of materials and products to the process. They reviewed a wide range of entries from various product manufacturers to identify which were worth noting to their peers.

PRODUCT Judges 1998



A PANEL OF FIVE JUDGES SPENT THE DAY IN OUR NEW YORK OFFICES EXAMINING MORE THAN 500 PRODUCT SUBMISSIONS.

In choosing our panel of judges for the Product Reports each year, we try to create a good balance of experts, taking into consideration the architect or designer's involvement with specifying materials and products, the type of design the person specializes in, and the size and location of his or her firm. This year, we brought together a particularly well-rounded group.

Berni Hui graduated from the University of Toronto in Fine Arts Studio. Her design career began in Tokyo, where she worked on a variety of projects, including the first Japanese Blockbuster store. She is now a project designer for Gensler, New York, where she is working on projects for Goldman Sachs.

Steven H. Goss, AIA, a senior associate and lead designer of the corporate studio for HLM Design (formerly JPJ Architects) in Dallas, is responsible for the design of all planning, architecture, and interior design projects. Goss received a bachelor's degree in architecture from Oklahoma State University.

Robert Siegel is a partner in New York's Garrison Siegel Architects. His current work includes the Korean Embassy in China, the Swiss Center in New York, and the master plan for Tokyo's Gotanda district. He graduated from Syracuse University's School of Architecture and received a master's degree in architecture from Columbia University.

Sandra Leibowitz, a sustainable design specialist and chair of the sustainable building materials committee for Hellmuth, Obata + Kassabaum in Washington, D.C., focuses on materials research and environmental specification development. She holds a master's degree in architecture from the University of Oregon with a concentration in sustainable design.

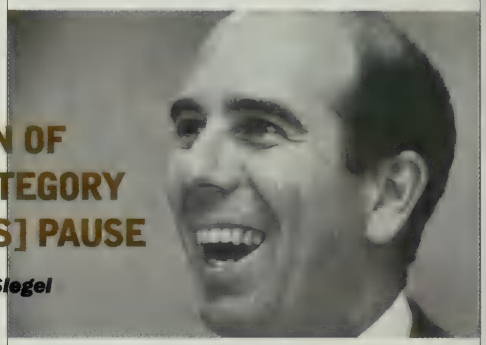
Dan Himmelberg, AIA, vice president at Gould Evans Affiliates in Kansas City, is the senior designer for the retail group and the director of the environmental graphic design group. He is overseeing the design of several projects, including the Times Square AMC Theater. He has a bachelor's degree in architecture from Kansas State University.

GENERAL DATA

Computer software and systems • Product literature
Design office equipment and materials

Technology products have become essential tools for design professionals. Every year we receive more submissions in this category, making it an increasingly difficult one to assess. This year, we expanded the category to include products that aren't traditional architectural tools, such as the wireless phones that are now ubiquitous on job sites.

THE PROLIFERATION OF PRODUCTS IN THIS CATEGORY MADE [THE JUDGES] PAUSE FOR REFLECTION. —*Robert Siegel*



Wide-format digital system

Xerox's 8830 Digital Document System (DDS) can copy, print, and scan engineering and technical documents from sizes A to E. For increased ease of use, printing jobs can be interrupted to make copies. With scan-to-network software, the DDS can store documents on a local or network drive. 800/XES-TALK. Xerox, East Rochester, N.Y. **CIRCLE 200**

Interior specs on CD-ROM

The MasterSpec interior design library on CD-ROM provides more than 75 specification sections, which are organized by CSI categories, including interior construction, finishes, furnishings, and equipment. With Masterworks 3.0 (free with the CD-ROM), designers can customize data and tailor it for use on a specific project. 800/424-5080. Arcom, Salt Lake City. **CIRCLE 201**

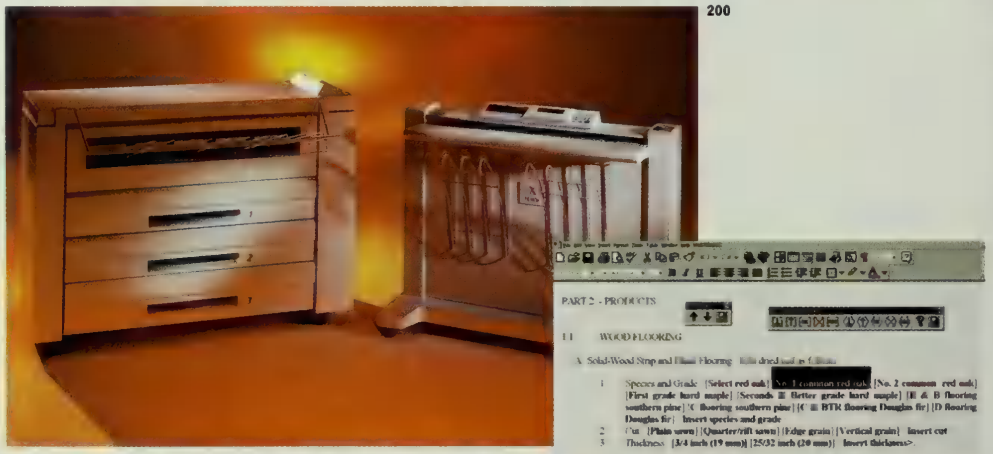
Accessible British products

The Virtual Design Centre's Web site and companion CD-ROM make foreign product information more accessible. The CD-ROM includes detailed information on various British products, allowing specifiers to shop without leaving the office. 011/44/171/928-7248. Virtual Design Centre, London. **CIRCLE 202**

Window and door software

Window Studio from Andersen Commercial Group is CAD-compatible software that allows users to design combinations of Andersen window and patio doors. The software also includes product specification text files in CSI format. [illegible] 26-1899. Andersen, North Bayport, Minn. **CIRCLE 203**

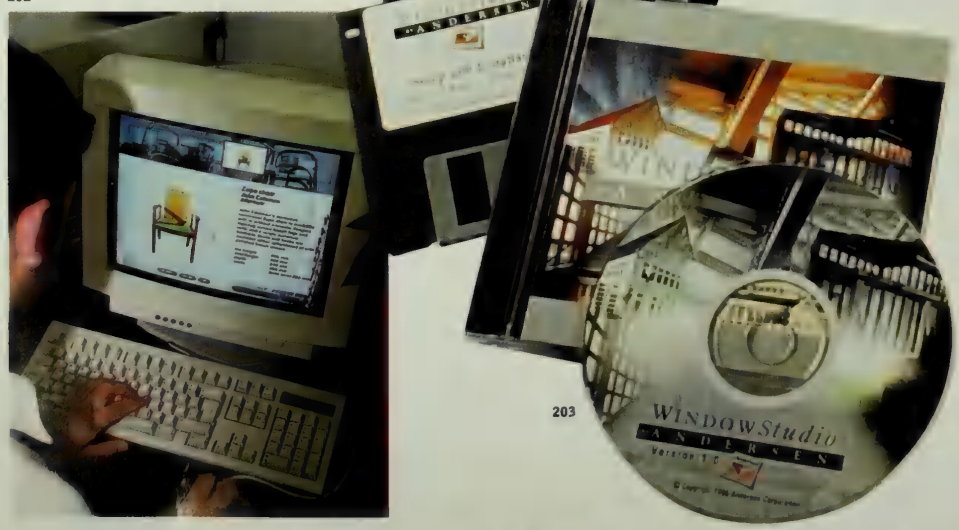
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202



203

Lighting design software

Columbia Lighting and Prescolite Mold-cast have created LitePro software for Windows 95 and NT. For indoor and outdoor lighting projects, designers can use the software for information on vertical and horizontal illuminance, exterior building shadowing, and other details. 510/562-3500. Columbia Lighting, San Leandro, Calif. **CIRCLE 204**

Wireless network on site

In response to industry demand for wireless communication on the construction site, Sprint has partnered with SONY and Samsung (shown) to develop a wireless, digital phone and battery system that provides approximately 2.5 hours of talk time. 800/480-4PCS. Sprint PCS, Kansas City. **CIRCLE 205**

Realistic graphic imaging

The latest version of Art•lantis Render 3D software (3.0) is compatible with ArchiCAD, MiniCAD, Arc+, Amapi, and Star. New functions include background editing as well as animated and virtual-reality creations in QuickTime, QuickTime VR, Video for Windows (AVI), and RealSpace. 415/431-3412. Abvent, San Francisco. **CIRCLE 206**

Client and project tracking

Sema4 software tracks project expenses and schedules and provides real-time processing of financial and accounting data. One section of the screen features a tree structure that displays all projects relating to a client. The other section displays relevant financial information. 800/545-7484. Semaphore, New York City. **CIRCLE 207**

Virtual building

In response to user demands, ArchiCAD's new version 6.0 features 3D editing, database links, an open API, and a variety of 2D drafting tools. Available for Windows 95 and NT and Macintosh operating systems. ArchiCAD 6.0 translates DWG files up to r14 and preserves any Xref files within ArchiCAD for later export to AutoCAD. 800/344-3468. Graphisoft, San Francisco. **CIRCLE 208**

Professional liability program

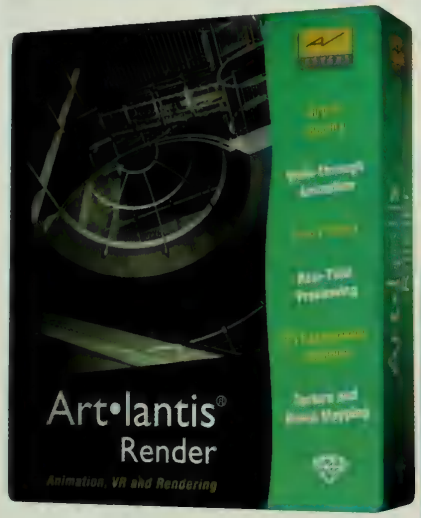
Victor O. Schinnerer's current Premier program for mid-sized architecture and engineering firms includes broader coverage of issues such as pollution, asbestos, equity interest, and insurance. 301/961-9800. Victor O. Schinnerer & Company, Chevy Chase, Md. **CIRCLE 209**



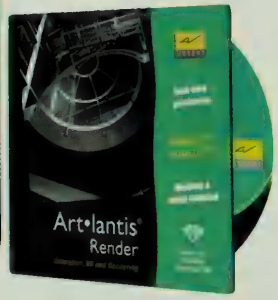
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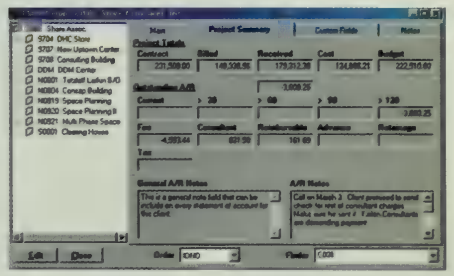
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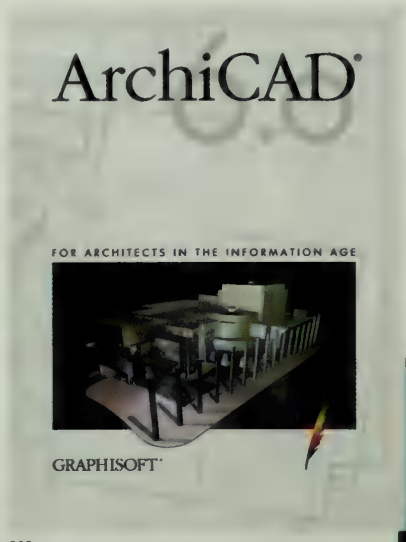


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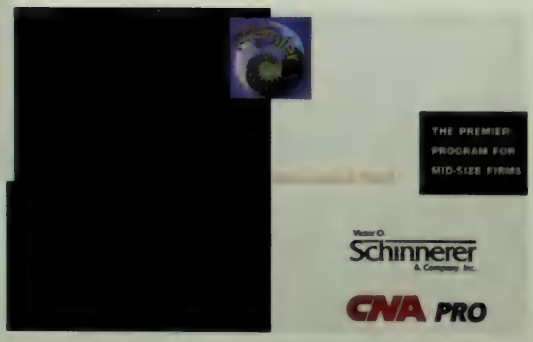


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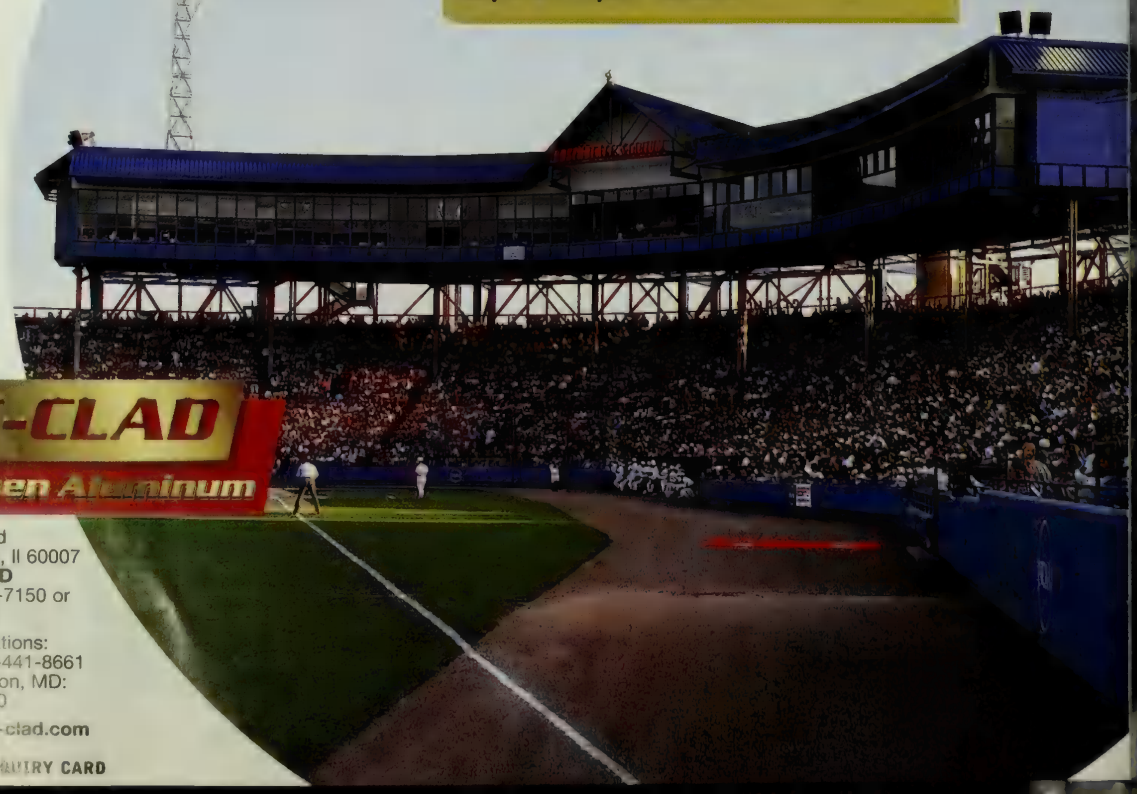
MAJOR LEAGUE MATERIAL

SNAP-CLAD™
Metal Roofing Panels

Petersen Aluminum Corporation's SNAP-CLAD Panels top the new $4.75 million press box and stadium club, completing an eight year long renovation of the 48-yr-old Rosenblatt Stadium in Omaha, Nebraska. The stadium plays host to the NCAA College World Series and serves as home field for the Omaha Royals. The new press box features a peaked metal roof, which dramatically altered the exterior appearance of the stadium. Boone Brothers Roofing Inc. in coordination with the general contractor, Weitz Company, Inc. installed over 11,000 square feet of SNAP-CLAD Panels manufactured by Petersen Aluminum Corporation. The panels are a custom blue PAC-CLAD finish and were corrective leveled to provide superior panel flatness. Color and panel appearance was critical considering the prominence of the roofing panels in the stadium design.

For more information on SNAP-CLAD Panels, please contact Petersen Aluminum Corporation, **1-800-PAC-CLAD or visit our web site @ http://www.pac-clad.com**

Rosenblatt Stadium
Omaha, NE
Owner: City of Omaha
Architect: Bahr, Vermeer & Haecker
General Contractor: Weitz Company Inc.
Roofing Contractor: Boone Bros. Roofing
Custom Color: Rosenblatt Blue
Profile: Snap-Clad



PAC-CLAD
Petersen Aluminum

1005 Tonne Road
Elk Grove Village, Il 60007
1-800-PAC-CLAD
FAX: 1-800-722-7150 or
1-847-956-7968

Other Plant Locations:
Tyler, TX: 1-800-441-8661
Annapolis Junction, MD:
1-800-344-1400

http://www.pac-clad.com

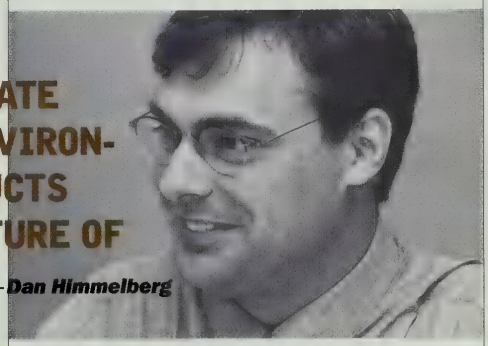
CIRCLE 46 ON INQUIRY CARD

SITE WORK

Earth retainage • Unit pavers
Site improvements • Landscape accessories

All five of the judges were particularly drawn to site work designs and products that were aesthetically pleasing without deliberately imitating natural elements. The more subtle the look, the better it fared with the panel. The unit pavers, retaining walls, and site furniture presented here all demonstrate that quality of subtlety.

DESIGNERS WANT TO CREATE 'NATURAL' MANMADE ENVIRONMENTS. WITH NEW PRODUCTS THAT EMBRACE THE NATURE OF ENVIRONMENT, WE CAN. —Dan Himmelberg



Concrete unit pavers
Hanover's Tumbled Brick concrete unit pavers have the look of worn stone. The pavers meet or exceed ASTM standard C936. 800/426-4242. Hanover Architectural Products, Hanover, Pa. CIRCLE 210

Retaining wall source
Mesa Retaining Walls from Tensar Earth Technologies have a block-to-grid connection with a structural geogrid for soil reinforcement. The walls are available in different facing options and a variety of color blends. 800/TENSAR-1. Tensar Earth Technologies, Atlanta. CIRCLE 211

Natural inspiration
Wausau Tile's precast-concrete Stoney Creek pavers are available in four color blends. Custom colors are also available for orders over 10,000 square feet. 800/388-8728. Wausau Tile, Wausau, Wis. CIRCLE 212

Streetscape seating
Landscape Forms' Plainwell bench and litter receptacles are made with partially recycled cast-aluminum frames that can be powder coated in a variety of colors. Seating and receptacle surfaces are available in ipe, oak, maple, or jarrah wood. 800/430-6203. Landscape Forms, Kalamazoo, Mich. CIRCLE 213

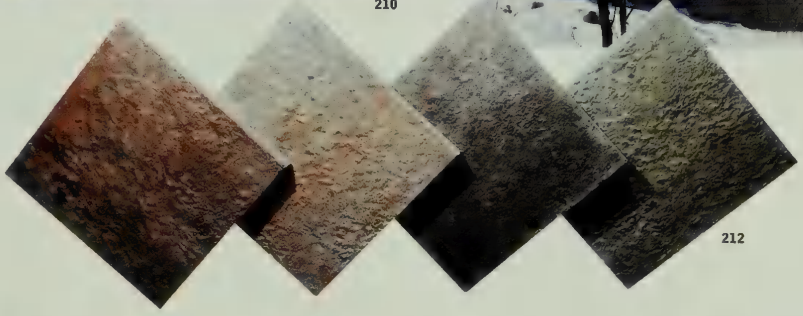
Retaining wall source, too
Keystone's residential wall is created with an interlocking, dry stacked assembly system. Instead of using mortar, the wall is held in place and aligned by fiberglass pins. The system is noncorrosive. 800/891-9791. Keystone Retaining Wall System, Minneapolis. CIRCLE 214



210



211



212

214



213





SEND ME AN ENTRY FORM! To request an entry form, complete the information below and return it to Marble From Greece.

By Telephone: (800) GREEKMARBLE
By Facsimile: (212) 644-9201
By Mail: MARBLE FROM GREECE c/o SACKS COMMUNICATIONS
545 MADISON AVENUE, NEW YORK, NY 10022

Name/Title: _____

Firm: _____

Address: _____

City/State/Code: _____

Telephone/Facsimile: _____

THE GREEK TRADE COMMISSION ANNOUNCES ITS MARBLE FROM GREECE 1999 DESIGN COMPETITION. ENTRIES ARE ENCOURAGED FOR DESIGN PROJECTS COMPLETED IN THE LAST TWO YEARS USING GREEK MARBLE. CASH AND/OR TRAVEL PRIZES WILL BE AWARDED TO WINNERS. THE DEADLINE FOR ENTRY IS JANUARY 31, 1999.

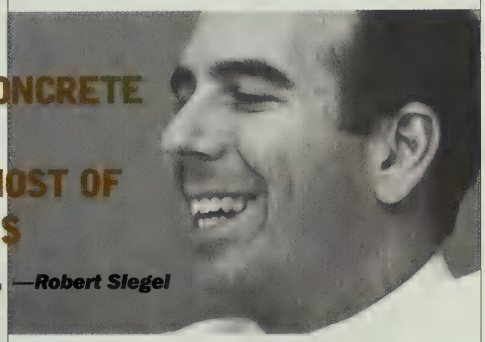
CIRCLE 36 ON INQUIRY CARD

CONCRETE

Concrete accessories, materials, and restoration
Form liners • Precast concrete

Concrete materials have seen substantial changes over the past 10 years. Form liners, for example, now produce beautiful, complex designs for highway barriers, while new stains give concrete a natural stone look. One of the most exciting recent products is autoclaved aerated concrete, a new type of manufactured building stone.

INNOVATION IN CONCRETE SHOULD BE FOLLOWED CLOSELY, AS MOST OF THE WORLD USES THIS MATERIAL EXTENSIVELY. —Robert Siegel



Concrete design and effect
Increte's Stain-Crete is a permanent chemical stain that creates color tones in existing concrete by reacting directly with its natural minerals. 800/752-4626. Increte Systems, Tampa. **CIRCLE 215**

Solid, aerated material
Autoclaved aerated concrete from YTONG combines cement, limestone, sand, and water to provide thermal and sound insulation with a six-hour fire rating. Wall, roof, and floor panels are lightweight and easy to work with and can be hand-sawn. 800-YTONGFL. YTONG, Haines City, Fla. **CIRCLE 216**

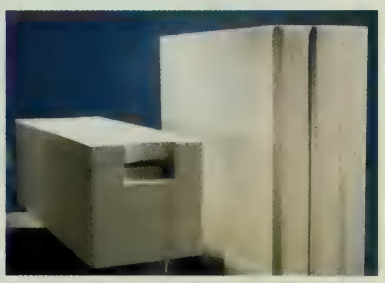
Concrete-forming system
AFM's Diamond Snap-Form is an insulated concrete forming system that uses expanded polystyrene panels connected by AFM's Diamond Snap-Ties every 12 inches. The system remains in place after the concrete is poured to become the wall, insulation, and facing material. 800/255-0176. AFM, Excelsior, Minn. **CIRCLE 217**

Prison all-in-one
The Tindall prison construction module is a double-cell unit made of precast-concrete panels that can be lifted and finished. Custom modules are also available. 800/849-4521. Tindall, Spartanburg, Pa. **CIRCLE 218**

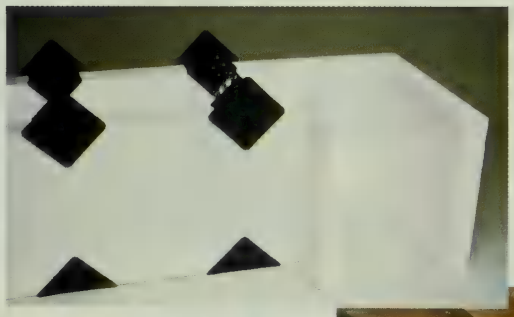
Concrete floor overlay
L. M. Scofield's Overlay has been developed as an abrasion-resistant interior concrete floor finish. It is available in ash white, light gray, beige cream, tile red, and natural gray. 800/800-9900. L. M. Scofield, Douglasville, Ga. **CIRCLE 219**



215



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217



218



219

THE BEST BUILDINGS ON EARTH ARE STILL BUILT BY HAND



More than a million bricks laid in a series of unique patterns, textures and colors make the Veterans Administration Health Care Facility in Detroit, Michigan, a striking example of masonry design by architects Smith, Hinchman & Grylls Associates. But masonry was chosen for more than its beauty and flexibility of design. Buildings built of masonry by skilled union craftworkers will outperform, outshine and outlast any others. Add to that the speed and efficiency of union masonry contractors, and you have a prescription for health care facilities that satisfies any schedule and budget. We're The International Masonry Institute, and we'd like to help you design and construct the best buildings on earth. Visit us on the World Wide Web at www.imiweb.org, or call us toll free at 1-800-IMI-0988 for design, technical and construction consultation.



The International Masonry Institute

WE BUILD FOR LIFE

UNION BUILT BY THE BEST HANDS IN THE BUSINESS

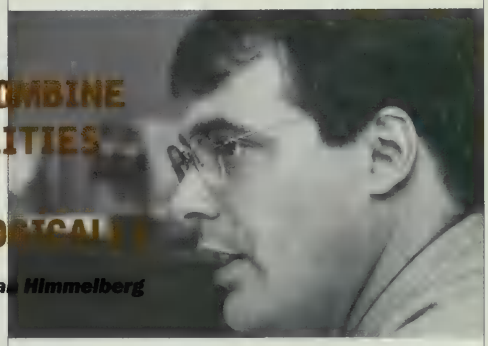
The International Masonry Institute — a labor/management partnership of the International Union of Bricklayers and Allied Craftworkers and the contractors who employ its members

MASONRY

Unit masonry • Stonework anchors and accessories

The judges found that most of the masonry products on the market today are being designed to look as natural as possible or to have an Old World feel. Among the examples are sand-coated bricks manufactured with the same recipe used by 17th-century masonries, and exterior cladding that resembles red sandstone.

THESE PRODUCTS COMBINE THE EVERLASTING QUALITIES OF MASONRY WITH TODAY'S TECHNOLOGICALLY DEMANDING DESIGNS. —Dan Himmelberg



Bricks from the heart

Heartland sand-coated bricks from Glen-Gery Bricks are available in six sizes: utility, modular, three-inch queen, 70 modular, econo, and 16 inches. They meet ASTM standard C216 for grade SW and type FBS. Colors include a variety of grays, roses, tans, and reds. 800/854-4863. Glen-Gery Brick, Iberia, Ohio. CIRCLE 220



220

Old-world building layers

Boral Brick's 17th Century bricks are made with a casting process in which moist wet clay is pressed into handmade wooden molds. The bricks are dusted with sand, which serves as a releasing agent and gives them their final color, then put through a two-week drying and firing process. 800/5-BORAL-5. Boral Bricks, Atlanta. CIRCLE 221



221

Natural masonry units

Renaissance masonry units are pressure-formed from calcium silicate, then autoclave cured. They are now available in cinnamon (red sandstone), wheat (soft buff), and nutmeg (striated white and beige), bringing the total available colors to 12. 800/265-8123. Arriscraft, Cambridge, Ont., Can. CIRCLE 222



222

U.K.-designed anchor system

CLS's Cintec is an anchor system in a mesh fabric sleeve. A cementlike grout is injected under low pressure into the sleeve, which restrains the flow and expands up to twice its normal diameter. The sleeve then takes on the shape of the designated area, like the arch shown at right. 800/363-6066. CLS Cintec, Nepean, Ont., Can. CIRCLE 223



223

Wausau's finest quality architectural windows and wall systems are engineered and manufactured by experienced, conscientious Associates for trouble-free performance and energy efficiency. What's the secret? Intelligent design. Precise fabrication. Easy installation. We place a high value on value. Ask about our industry-leading 10-year standard warranty.

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WAUSAU METALS

apogee

CIRCLE 37 ON INQUIRY CARD

METALS

Architectural metalwork • Perforated metals
Railings and handrails

The metal products submitted for our panel's review had uses ranging from the structural and utilitarian to the sculptural. Whether bolted, welded, cast, or woven together, they provided a wide range of architectural possibilities. While all of the metal products were well received by the judges, the five below really caught their eye.

ENTRIES IN THIS CATEGORY CONTAINED THE MOST VARIETY OF COLOR, TEXTURE, AND FORM AND COVERED THE WIDEST RANGE OF APPLICATIONS. ***—Robert Siegel***

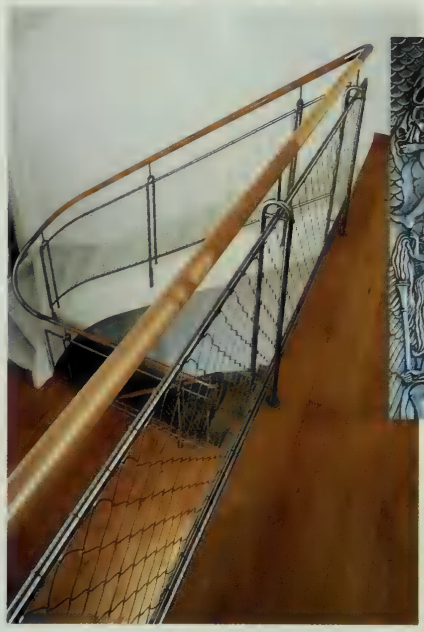
Interior and exterior cable net
DecorCable's stainless-steel X-Tend flexible cable net can be used for displays, shelving, furniture, stairways, or cable components. The stainless-steel fabric mesh, for interior and exterior use, has the structural properties of a membrane or tent. 800/444-6271. DecorCable, Chicago. **CIRCLE 224**

Custom-designed frieze
For a client who wanted to re-create a wall frieze from the SS *Normandie* for his home, Forms + Surfaces used a bonded metal in a resin mold. The design team worked from a color photograph that documented the Art Deco frieze, which was destroyed when the ship burned. It measures 7½ feet by 11 feet by 3 inches. 877/626-7788. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 225**

Railings for children
Hewi's balustrades now include small-diameter handrails at the right height for children. The rails are made of nylon with steel inserts. 877/HEWI-INC. Hewi, Lancaster, Pa. **CIRCLE 226**

Metal column covers
MM Systems' aluminum column covers feature circular, round, and rectangular profiles. Available in 36 standard and custom color finishes and covered with Kynar 500 or Hylar 5000. 800/241-3460. MM Systems, Tucker, Ga. **CIRCLE 227**

Exterior metal cladding
Foamwall, Centria's exterior metal cladding, is a lightweight, highly insulated composite panel system. 412/299-8240. Centria, Moon Township, Pa. **CIRCLE 228**



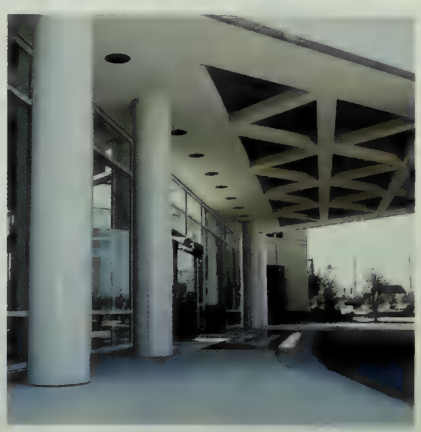
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WOODS & PLASTICS

Architectural woodwork • Laminates
Prefabricated wood joists and trusses

While forest preservation continues to be an important topic in the environmental movement, its relevance to designers lies in the choices they make about the type and quantity of wood to specify. In selecting products within this category, the judges kept these issues in mind, choosing, for instance, a guide to specifying certified forest products.

ALONG WITH THOUGHTFUL USE OF ENGINEERED LUMBER, 'GOOD WOOD' PLAYS AN IMPORTANT ROLE IN PRESERVING FOREST HEALTH. —Sandra Leibowitz



Prefab shearwall

The Simpson Strong-Wall is a factory-built wood shearwall that comes complete with preattached hold-downs. Less expensive than site-built shearwalls, it also provides more strength. 800/999-5099. Simpson Strong-Tie, Pleasanton, Calif. CIRCLE 229

Perforated plastic sheets

Plasti-Perf, a perforated polypropylene plastic sheet, is stocked in .063 and .125 gauges, and with hole sizes from 3/32- to 1/8-inch. 800/237-3820. McNichols Co., Tampa. CIRCLE 230

Engineered wood beams

Parallam parallel strand lumber beams can span up to 60 feet. The high-strength, defect-free beams are available in cambered and noncambered configurations. 800/423-5808. Trus Joist MacMillan, Boise. CIRCLE 231

Certified forest products guide

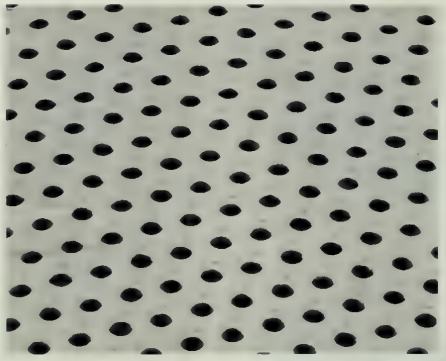
To qualify as a certified forest product, a wood product must come from a forest that has been independently audited to ensure it is being managed in a way that maintains the health of the ecosystem. This brochure explains how to develop specifications for such products. 503/590-6600. Certified Forest Products Council, Beaverton, Oreg. CIRCLE 232

High-pressure laminates

ChemArmor high-pressure laminates are resistant to more than 100 substances, including acids, solvents, bases, reagents, and difficult stains, such as India ink. Almost two dozen colors and patterns are available. 800/638-4380. Formica, Aiderton, Md. CIRCLE 233



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Certified Forest Products Council

A Guide to Specifying Certified Forest Products

232



TODAY'S PRODUCTS DEMONSTRATE THAT ARCHITECTS DON'T NEED TO ENDANGER RESOURCES TO ACHIEVE STYLE. —*Elana Frankel*

EDITOR'S CHOICE

Balustrade system

Style-Mark has added seven new sizes of balustrades and two new sizes of rails to its product line. The traditionally styled balusters, made from fiberglass-reinforced urethane, are now available in heights from 18 to 36 inches. The rail system includes balusters, top and base rails, and newels. The newels and rails are also made from urethane but are reinforced with PVC. The system is double-primed using a UV-stable exterior coating that requires no additional finish, and is resistant to rot, weather, and insect damage. 800/446-3040. Style-Mark, Archbold, Ohio. **CIRCLE 234**



234

Engineered wood product line

Willamette's line of engineered wood products, called the E-Z Frame system, consists of glulam beams capable of spanning up to 130 feet in several grades and sizes; StrucLam laminated veneer lumber, for unexposed headers and beams; StrucJoist engineered wood joists, for floors or roofing; and E-Z Rim Board, for rim joists. The company backs up the system with a staff of engineers and field representatives, and provides a guarantee that all of its products are free from defects. 541/926-7771. Willamette, Albany, Oreg. **CIRCLE 235**



235

Laminate flooring

Bruce Laminate Floors has expanded its Traffic Zone oak collection to include Mountain Oak. The product is available in 7⅝-inch-wide strips to produce a wide-plank appearance, and comes in natural and chestnut finishes. Other additions to the Traffic Zone line include Toledo, a 15⅜-inch-square pattern inspired by ceramic tile, and Terrana, an octagon-shaped stone pattern that can incorporate matching or contrasting diamond-shaped accent patterns. The Toledo and Terrana patterns are available in two colors, Rossa and Fontana. The 5/16-inch-thick materials can be installed over existing floors. 800/722-4647. Bruce Laminate Floors, Dallas. **CIRCLE 236**



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THERMAL & MOISTURE

Protection • Insulation • Siding
Roof and wall panels • Skylight structures

In a category that is not always known for sustainable or environmentally friendly products, the judges identified responsible manufacturers who are creating some new and noteworthy items. Sustainability expert Sandra Leibowitz from HOK was particularly excited by these recent developments.

WE CHOSE ENVIRONMENTALLY SOUND PRODUCTS IN THIS CATEGORY, INCLUDING INSULATION THAT DOES NOT USE HCFCs AND A COPPER ROOF THAT'S LEAD-FREE. —***Sandra Leibowitz***

Pan and batten system
This new pan and batten system uses an ultra-high batten cap in heights up to 11 inches to create deep profiles and cast shadows. 909/829-8618. Custom Panel Industries, Rancho Cucamonga, Calif. CIRCLE 237

Fire-finished building panel
AFM's FireFinish is an R-Control structural building panel with a fire-resistant thermal barrier directly applied to the OSB surface, eliminating the need for gypsum board. 877/R-CONTROL. AFM, Excelsior, Minn. CIRCLE 238

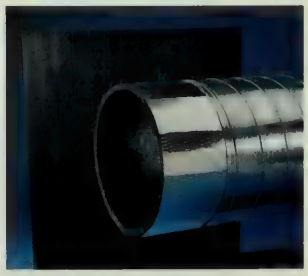
HVAC duct insulation
ToughGard Ultra Round is a new semi-rigid acoustical and thermal insulation used to line spiral and oval metal HVAC duct systems from CertainTeed. 800/233-8990. CertainTeed, Valley Forge, Pa. CIRCLE 239

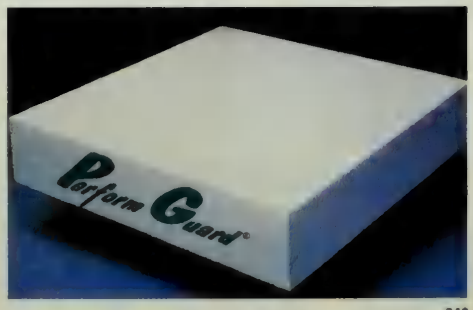
Environmental insulation
AFM's Perform Guard is insect-resistant, expanded polystyrene (EPS) insulation that does not contain CFCs, HCFCs, or formaldehyde, preventing decomposition, decay, and off-gassing. Perform Guard is used with AFM's R-Control and Diamond Snap-Form concrete-forming systems. 877/R-CONTROL. AFM, Excelsior, Minn. CIRCLE 240

Lead-free roofing
FreedomGray roofing is made from Revere Copper and is coated with a preweathered zinc/tin coating from Follansbee. The process gives the lead-free roofing a weathered gray look. 800/448-1776. Revere Copper Products, Rome, N.Y. CIRCLE 241


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EDITOR'S CHOICE

Coating application

Reynolds Metal's collection of architectural products now includes Durogloss Colorweld 3000, a polymer-based paint finish in bright glossy colors for the company's Reynobond aluminum composite material (ACM) and flat-sheet material. Durogloss-painted ACM and flat sheet are available in standard colors; they can also be matched to custom corporate colors. Applications for the finish include canopies, signage, columns, fascia, trim, and accents. 804/281-3939. Reynolds Metal Company, Richmond, Va. CIRCLE 242

Mortarless siding

Novabrik from Allan Block is a split-face concrete masonry product made with an interlocking tongue-and-groove design that screws into place. It does not require a foundation and does not need to be installed by brickmasons. Color options include snow white and rustic red, among others. Measuring 3 by 2.6 by 8 inches, Novabrik can be used in both commercial and residential settings. 800/899-5309. Allan Block, Edina, Minn. CIRCLE 243

Enhanced board performance

Johns Manville's new darker TopLoc coating for its Fesco and Retro-Fit boards optimizes the bitumen adhesion between membrane and board. Mopping asphalt takes more easily to the improved surface because it's smoother and produces less dust. 303/294-9944. Johns Manville, Denver. CIRCLE 244

Light block shades

The electric LightBlock shade from VELUX-AMERICA, Inc., is available for all models and sizes of the company's roof windows and skylights. The shade has an energy-efficient coating that reflects heat. LightBlock is available in eggshell white. 800/283-2831. VELUX-AMERICA, Inc. Greenwood, S.C. CIRCLE 245

Exterior insulation finish

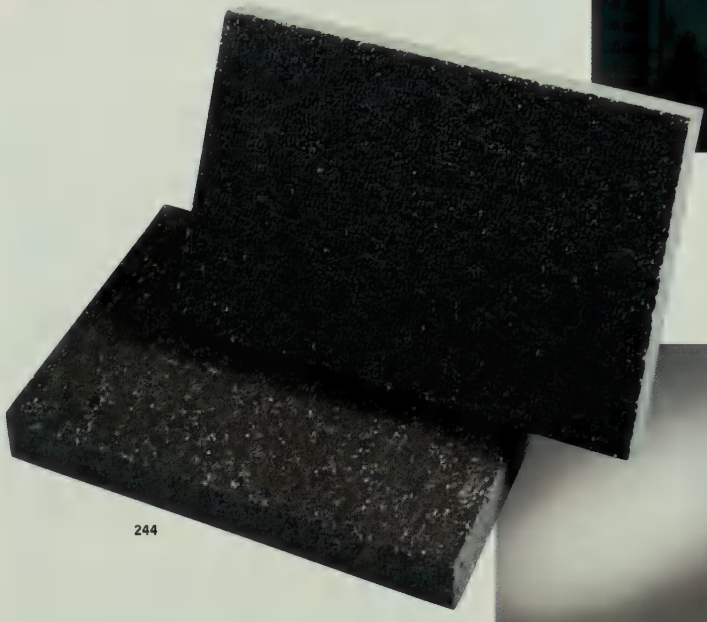
TEC's Ful-O-Mite exterior insulation finish system can be applied in the field to approved substrate; panelized in the preassembly stage and built into place on the skeleton; or created in a combination of the two. The installed system weighs approximately one pound per square foot. TEC offers 16 standard colors as well as custom shades. 800/323-7407. TEC, Inc., Palatine, Ill. CIRCLE 246



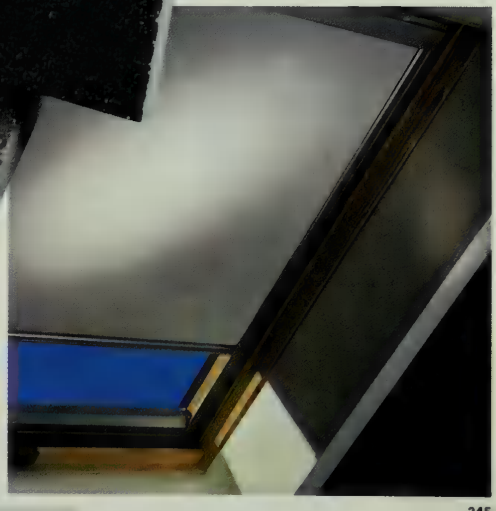
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243



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245



246


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DOORS & WINDOWS

Fire-rated glazed wall/door assemblies
Weatherstripping and thresholds • Special doors

When evaluating products in this category, as in the others, the judges used performance, appearance, and value as their criteria. However, here they were also concerned with personal safety and protection from the elements. Most of the products chosen deal with these issues in new ways.

WE FAVORED PRODUCTS IN THIS CATEGORY THAT TOOK PERSONAL SAFETY AS WELL AS INNOVATION INTO ACCOUNT. —**Berni Hui**



Engineered water flashing

The Sto Sill Sentry captures water from beneath windows and other wall openings and channels it to the exterior of the wall, preventing it from entering the wall cavity. The flashing is made of rigid polyvinyl chloride (PVC) and can support the weight of windows or doors. It is noncorrosive, nonstaining, and eliminates the thermal bridge between exterior and interior. The Sto Sill Sentry can be used for both new and retrofit applications. It is available in 10-foot lengths, which are cut on site to custom-fit each window opening. 888/522-0184. Sto Corp., Atlanta. **CIRCLE 247**

Upward-acting glass doors

Clopay's Model 901, a full-view, upward-acting sectional door, is available with insulated glass, wire glass, Plexiglas, DSB, or aluminum panels. It provides protection against rain, snow, heat, and cold and is designed to withstand wind-load pressures as required by building codes. Standard finishes include white or brown, clear anodized aluminum, or anodized bronze. Glazing options, such as thermal glass, are also available. 800/2CLOPAY. Clopay Building Products, Cincinatti. **CIRCLE 248**

Fire-rated glazing

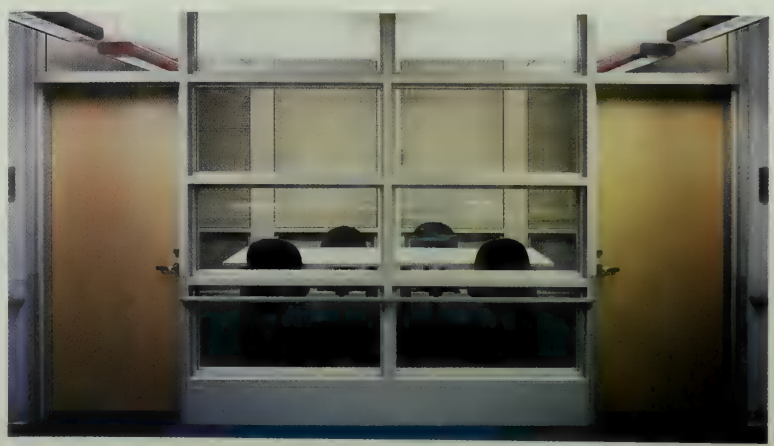
FireLite Plus is a wireless glass that is fire-rated and impact-safe, meeting ANSI standard Z97.1 and CPSC standard 16FR1201 in category II. The glazing fits in standard fire-rated frames and comes in sizes up to 36 by 84 inches. 800/426-0279. Technical Glass Products, Kirkland, Wash. **CIRCLE 249**



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DOORS & WINDOWS

Fire-rated glazed wall/door assemblies
Weatherstripping and thresholds • Special doors

Intumescent glazing tape

Zero International's intumet glazing tape has successfully been tested with ¼-inch wire glass for positive-pressure fire performance under the new UBC 7-2 1997 fire door standard. It is applied using pressure-sensitive adhesive (PSA), eliminating the spacers and caulks used by other systems. 800/635-5335. Zero International, Bronx, N.Y. **CIRCLE 250**

Composite sectional door

The Genesis sectional door is made of a composite material called Fybron. It is dent- and rust-proof, scratch-resistant, and will not pinch fingers when manually opened or closed. The door is available in a white or almond powder-coat and in three sizes. 800/4-RAYNOR, Raynor Garage Doors, Dixon, Ill. **CIRCLE 251**

Fire-rated glazing compound

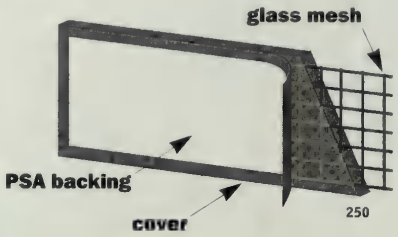
FireGlaze is a black flexible sealant that is gun-applied. It allows glass panels up to 106 inches (in any direction) to be 20-, 45-, and 90-minute fire rated when used with a hollow metal door and frame, and Pilkington's Pyroshield polished ¼-inch wire glass. 800/283-9988. Pemko Manufacturing, Ventura, Calif. **CIRCLE 252**

Hardware by Sir Norman

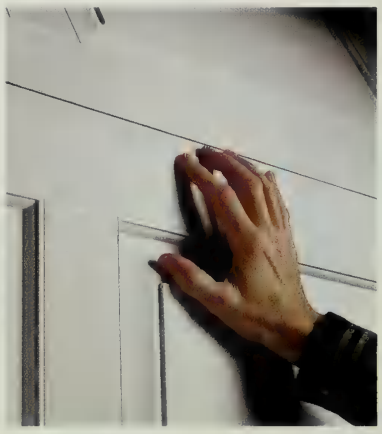
Sir Norman Foster has designed a collection of hardware for Fusital, a division of Gruppo Valli & Valli. Foster was inspired by the form of a bird in creating these new designs, which are available in wood, metal, black rubber, leather, and other materials. The Italian hardware manufacturer also produces door levers, knobs, and other accessories. 800/423-7161. Gruppo Valli & Valli, Duarte, Calif. **CIRCLE 253**

Exit door device

Von Duprin has introduced fire exit hardware that does not need a bottom rod. The less-bottom-rod option eliminates the need for a floor strike, reducing the installation and maintenance associated with vertical rod applications. Applied to pairs of doors, the device includes a spring-loaded latch that installs in the lower door edge. When exposed to heat, the latch releases one door leaf and engages the other, keeping doors closed and aligned during a fire. 317/897-9944. Von Duprin, Indianapolis. **CIRCLE 254**



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Q: Why specify Timely prefinished door frames?
A: For the same reasons you specify prefinished doors.

Like prefinished doors, Timely prefinished steel door frames eliminate the jobsite painting headaches of delays, spills, sloppy workmanship, touch-ups and work interruptions. You also save on paint and labor. In addition, your customers get greater performance and durability from our controlled, factory-applied finishes. All good reasons to specify both prefinished doors and Timely prefinished door frames. There are plenty of other benefits. For example, Timely's total opening concept permits fast, hassle-free installations after the walls are in place and painted.

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CIRCLE 39 ON INQUIRY CARD

FINISHES

Carpet • Tile • Tile-setting materials & accessories
Resilient flooring • Ceiling systems

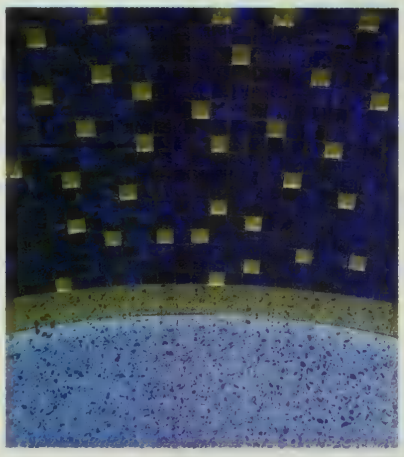
This year, mosaic, patterned, and inlay tile were all the rage. As the demand for quality products and skilled installers increased, manufacturers delivered the goods, from terrazzo-style tile to an in-depth, technical, tile-installation guide. Another trend that emerged this year was carpet recycling, which extends the life of a product in an ecofriendly way.

PRODUCTS ARE NOW BEING MADE THAT REPRESENT A SIGNIFICANT NEW APPROACH TO THINKING ABOUT THE FULL LIFE CYCLE OF FINISHES. —Sandra Leibowitz



Terrazzo-like tiles

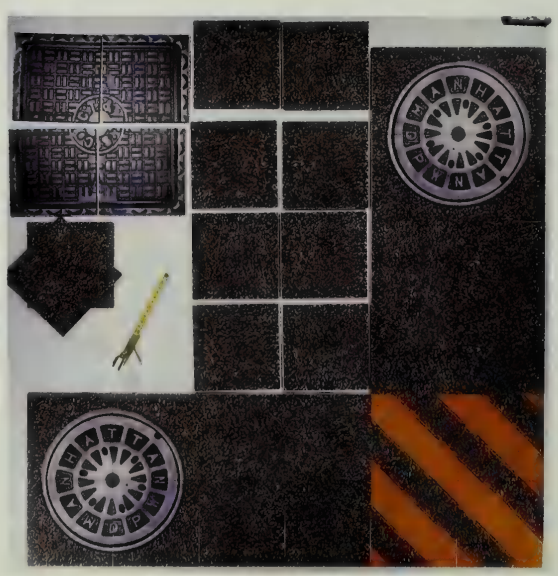
Bisazza's new Logos collection, designed by Atelier Mendini, includes terrazzo-like tiles for floors, walls, counters, and, because they are lightweight, even furniture veneer. They can also be used on preexisting floors or surfaces. To create the tiles, glass granules held together by an organic amalgam are embedded in a composite base, creating a glistening effect. At right, Logos is shown with Bisazza's Le Gemme glass mosaic tiles and Oro 24 karat gold-leaf mosaics on a wall. 305/597-4099. Bisazza, Miami. CIRCLE 255



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Street-smart tiles

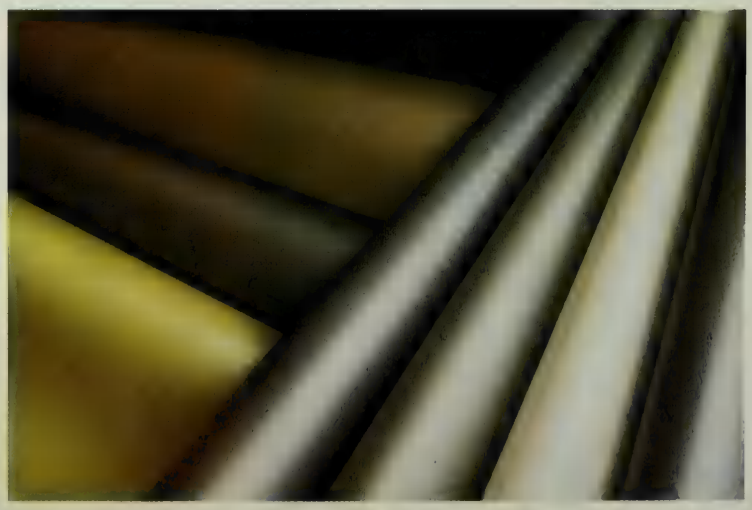
Based on images and textures from the streets of lower Manhattan, Street Smarts ceramic tiles from Imagine Tile are made with all-natural materials to look like manhole covers, asphalt, and crosswalks. Floor tiles are available in eight, 12, or 16 inches square and in glossy or slip-resistant surfaces. Wall tiles are available in eight or 10 inches square. 800/680-TILE. Imagine Tile, Jersey City, N.J. CIRCLE 256



256

Resilient flooring

LonFloor Galvanized resilient sheet vinyl flooring from Lonseal looks like a solid surface but has a subtle galvanized pattern. The flooring has a wear layer of .016 inches and a cloth backing measuring .084 inches. It is available in six-by-60-foot rolls in seven patterns: White Diamond, Platinum, Peridot, Black Pearl, Crystal Blue, Gold, and Granite. 800/872-7111. Lonseal, Carson, Calif. CIRCLE 257



257


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Ceiling system

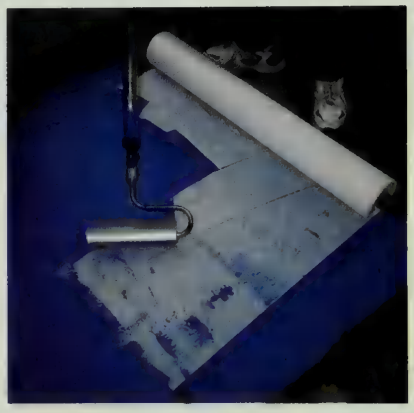
Gordon's Aluma-Vault is a ceiling grid system that integrates lighting, air handling, and sprinklers. Shown here is the ceiling in a ballroom at the Denver Center for the Performing Arts. The lighting combines recessed incandescents and fiber optics. The curved cross runners, spaced three feet apart, provide the housing for the sprinklers and fiber optics. Movable theatrical lights are hung throughout the ceiling by two-way hinging access panels made from perforated aluminum. 800/747-8954. Gordon, Shreveport, La. **CIRCLE 258**



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Antifracture tile and stone

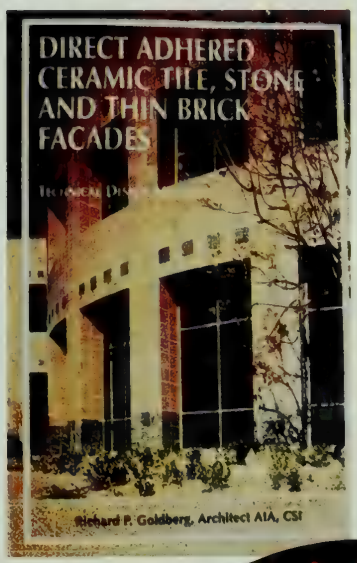
Laticrete's Blue 92 is a two-part system for tile and stone floors that consists of a blue liquid rubber and a reinforcing fabric. The company offers a written guarantee that the system will prevent tile and stone floors from cracking. 800/359-3297. Laticrete, Bethany, Conn. **CIRCLE 259**



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Exterior tile-installation guide

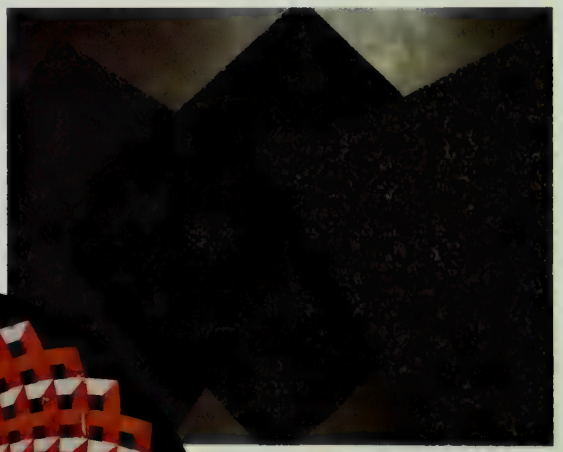
Laticrete has published an information and technical guide by Richard Goldberg, AIA, for the design community. The book is a technical manual that provides step-by-step methodologies for installing direct-adhered tile, stone, and thin brick on building facades. 800/359-3297. Laticrete, Bethany, Conn. **CIRCLE 260**



260

Renewable carpet program

Earth Square, Milliken Carpet's renewable carpet program, rejuvenates old carpet for reuse. In a three-step process, customers' old carpet tiles are supercleaned, retextured, and dyed, creating recycled tiles that cost 50 percent less than new carpet. Milliken will ship the carpet back to the customer to be reinstalled. All Milliken carpets can be renewed through the Earth Square process. 877/E2-RENEW. Milliken Carpet, West LaGrange, Ga. **CIRCLE 261**



261

Inlaying elegance

In Latin, *intarsia* refers to the process of inlaying fine materials to create lasting beauty and elegance. The American company Intarsia uses waterjet cutting, directed by a CAD/CAM computer, to create elaborate marble and granite designs. The Medallions collection, an example of which is shown at right, comes assembled in round, oval, square, or rectangular formats in 24- to 96-inch sizes. 407/859-5800. Intarsia, Orlando, Fla. **CIRCLE 262**



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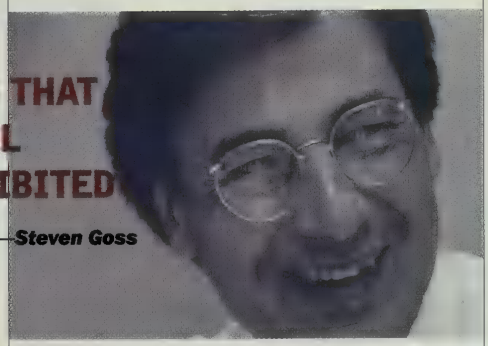

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ACOUSTICAL CEILING & SPECIALTY PRODUCTS

SPECIALTIES

Toilet, bath, and office accessories

When choosing products in the specialties category, the judges favored those that got their points across clearly and simply. Starck's elegant bathroom fixtures, Steelcase's unique power accessories for the office, American Specialties' user-friendly hand dryer, and Metpar's ecofriendly toilet partitions all exhibit a single strong idea.

THE SUBMISSIONS THAT STOOD OUT FOR THE PANEL WERE THOSE THAT EXHIBITED A SINGLE STRONG IDEA. —*Steven Goss*



Bathroom collection
Philippe Starck has designed a new bathroom collection called Edition 2, available from Duravit. The collection includes an elegant one-piece porcelain toilet with an elongated bowl. 888/387-2848. Duravit, Duluth, Ga. **CIRCLE 263**

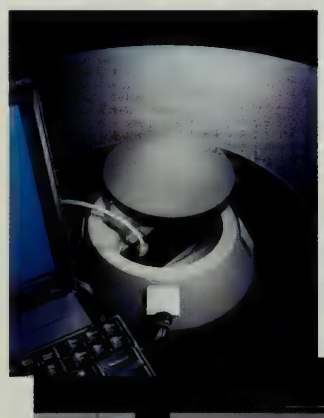
ADA-compliant hand dryer
American Specialties has developed an ADA-compliant surface-mounted hand dryer. The Profile dryer's infrared sensors start the dual jets of warm air when hands are placed under the nozzle. The dryer stops when hands are taken away. 914/476-9000. American Specialties, Yonkers, N.Y. **CIRCLE 264**

Office system enhancements
Two new components of Steelcase's office system are the Conjunction corner shelves and hub table and post. The shelves fit around power access structures, while the table and post are modular components that house four electrical outlets on a single circuit and accommodate one communication faceplate. 800/333-9939 x799. Steelcase, Grand Rapids, Mich. **CIRCLE 265**

Toilet partitions
Metpar's Polly toilet partitions are made from fire-rated recycled plastic. Other features include a concealed lock with an in-use indicator; stainless-steel pilaster mountings with leveling bolts; contoured corners on the doors and panels; and heat sinks on all the doors and panels. A lifetime guarantee promises that the plastic will never rust or delaminate. 516/333-2600. Metpar, Westbury, N.Y. **CIRCLE 266**



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EQUIPMENT

Residential appliances • Waste chutes and collectors
Audiovisual equipment

The panel chose products in this category that represent technological trends affecting equipment for both corporate and residential environments. Audiovisual products, like Smart Board, and appliances, like Viking's and Jenn-Air's kitchen stovetops, are enhancing the workplace and bringing commercial standards to the home.

AS DESIGNERS, WE HAVE TO KNOW ABOUT TECHNOLOGICAL TRENDS FOR EQUIPMENT THAT WILL PLAY A LARGE ROLE IN THE FUTURE. —**Berni Hui**

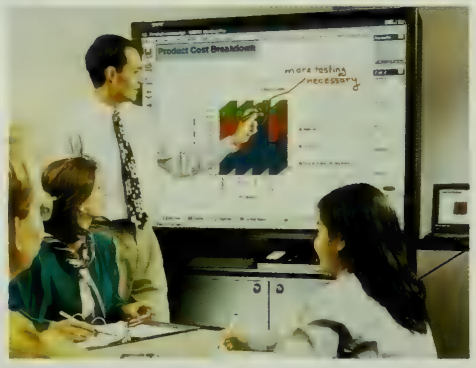


A dry-erase board with memory
An ideal tool for design meetings, Smart Board looks and acts like a conventional dry-erase board. But when the board is linked to a computer, what's written on it can be saved to disk and printed out. Users can also use a finger as a point-and-click device to operate computer applications that are projected onto the board. 888/42-SMART. SMART Technologies, Calgary, Alta., Can. **CIRCLE 267**

A built-in wok for the home
This 24-inch-wide wok/cooker gives the kitchen counter a restaurant-quality cooking appliance. The gas burner reaches 27,500 BTUs. 888/845-4641. Viking Range Corp., Greenwood, Miss. **CIRCLE 268**

Stashing ash trash
The Bullet Buttler ash receptacle is a stylish stand-in for the conventional, open-face ash can, which always seems to be overflowing. The closed canister, rounded at both ends, comes in polished and coated aluminum and standard and custom powder-coated colors. The smaller model can handle 100 cigarette butts and the larger fits 200. 800/451-0410. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 269**

More professional cooktops
Jenn-Air offers restaurant-quality gas cooking appliances for residential kitchens. Available in 48-, 36- (shown), and 30-inch models, the cooktop features electronic, pilotless ignition and burners that can be adjusted from 800 to 15,000 BTUs. 800/536-6247. Jenn-Air, Newton, Iowa. **CIRCLE 270**



267



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270



269

FURNISHINGS

Furniture

Furniture for the home and the office (and the home office) has seen subtle improvements in recent years. Cordless blinds and an ADA-compliant filing cabinet solve safety problems, while new office chairs and adjustable workstations address ergonomic issues. The products highlighted here solve these problems in an aesthetically pleasing way.

ALTHOUGH SEEMINGLY INSIGNIFICANT, A DEVELOPMENT SUCH AS THE CORDLESS BLIND IS UNDOUBTEDLY INNOVATIVE FOR THIS CATEGORY. —***Berni Hui***

File-friendly cabinet

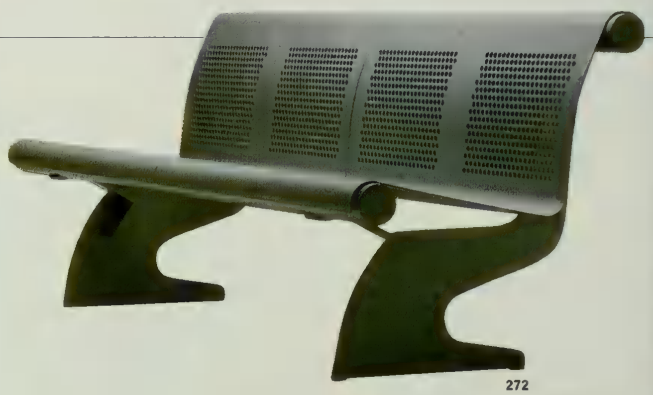
The Arcus lateral file from Office Specialty is available in 60 standard colors as well as custom colors. The pulls may also be specified in 15 colors. The ADA-compliant cabinet, with four lateral drawers and a lock at the top, measures a total of 44 inches. 905/836-7676. Office Specialty, Holland Landing, Ont., Can. **CIRCLE 271**



271

Sit there—it's vacante

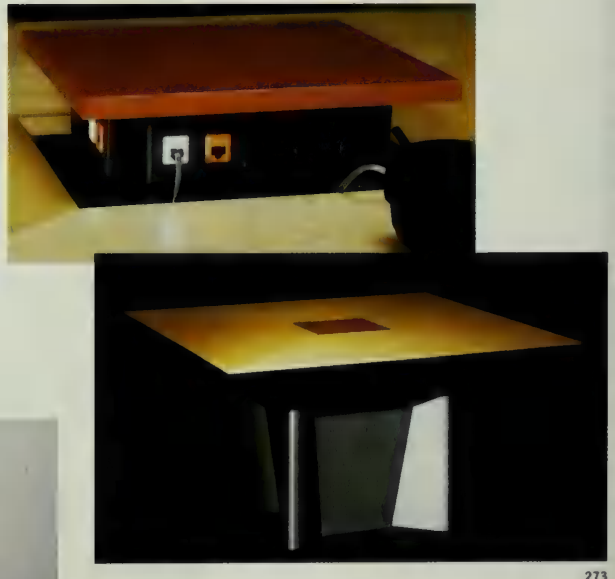
The Vacante seat from Forms + Surfaces (in cooperation with Sellex Spain) was created by architect Enric Miralles. The company is currently expanding the line to include an upholstered version in wood or metal, and complementary products such as litter receptacles, planters, side tables, and bicycle racks. 877/525-5566. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 272**



272

Conference table with pop

Designer Edward F. Weller III has created a new conference table for Halcon's Gemini collection. The center square pops up to accommodate electronic and voice communications. 507/533-4235. Halcon, Stewartville, Minn. **CIRCLE 273**



273

Tiny tables

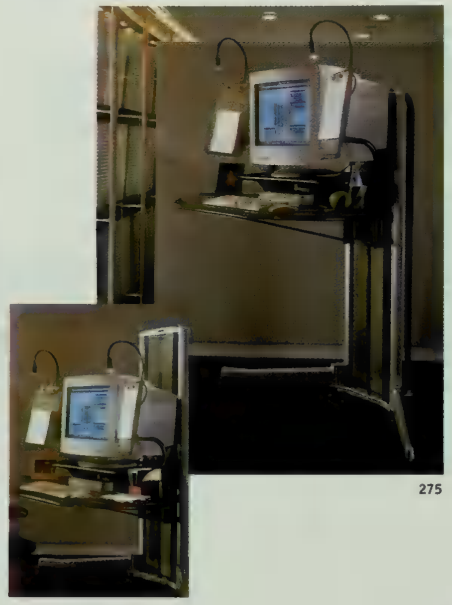
The methacrylate polystyrene tops of Zero's Art Café tables are removable for use as trays and come in black, white, blue, opaline orange, and transparent with serigraphic patterns. The supporting structure consists of cast-aluminum legs bound by a steel ring, finished in protective gray powder. 401/724-4470. In New York City, 212/925-3615. Zero U.S. Corporation, Lincoln, R.I. **CIRCLE 274**



274

Computer stand with flexibility

Designer Richard Holbrook has designed a new computer furniture system for Herman Miller called the Levity Suite, which consists of three components. The Interaction Tower uses a counterweighted system to adjust the keyboard, mouse, and monitor to heights from nine to 48 inches above the floor. The equipment cart holds a CPU, a printer, and a built-in display chart. A mobile worktable provides an additional work surface. 800/851-1196. Herman Miller, Zeeland, Mich. CIRCLE 275



275

Tom terrific

Keilhauer's Tom chair is both functional and attractive. It is available in four types of upholstery; three back heights; five arm types; three seat depths; two widths; and two colors: black or gray. The Tom can be raised, lowered, tilted, and otherwise adjusted for comfort. 416/759-5665. Keilhauer, Scarborough, Ont., Can. CIRCLE 276



276

Leaning tower of shelves

Jonah Zuckerman of City Joinery designed the remarkably stable Leaning Shelves: the more weight placed on them, the sturdier they become. The shelves shown are made from birch and walnut; other wood species are available. The shelves are 86 inches high, 56 inches wide, and 16½ inches deep, and can be joined end to end to create wider shelf systems. 718/596-6502. City Joinery, Brooklyn, N.Y. CIRCLE 277



277

Cordless blinds lead the blinds

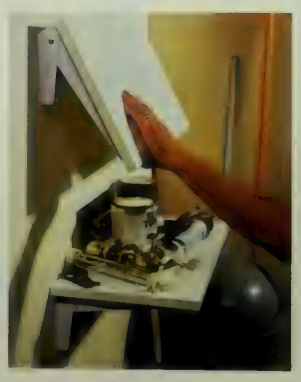
The Mark I cordless blinds from Levolor have no lift cords and are raised and lowered simply by moving the bottom rail. This creates a safer environment for children and pets and a sleeker appearance. The blinds are tilted by turning a rod at one end. The Mark I is available in 110 colors. 800/826-8021. Levolor Contract, High Point, N.C. CIRCLE 278



278

Folding shelf brackets

Stanley Works' new folding shelf brackets allow shelves to be folded down when they are not being used, to avoid personal injury. Able to support up to 150 pounds, the brackets attach to wall studs and have a bright powdered-white finish. The brackets can accommodate shelves 12 inches deep. 800/STANLEY. The Stanley Works, New Britain, Conn. CIRCLE 279



279

SPECIAL CONSTRUCTION

Glazed and vaulted structures

The judges had fun choosing products in this category. They opted to highlight two types of unique structural systems that are beginning to pop up in cities around the United States.

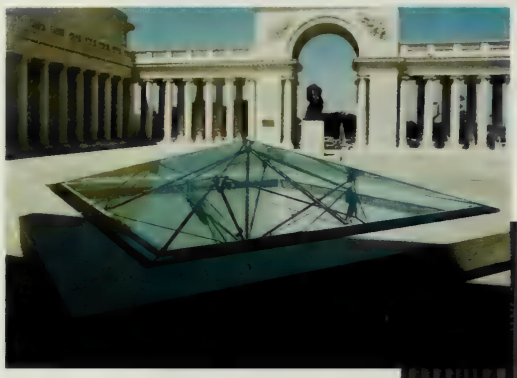
Invisible fasteners

With Pilkington Planar's structural glass system, Integra, structural fasteners are placed inside a laminate layer. Integra was first used in the United States for the surface of the pyramid at the California Palace of the Legion of Honor in San Francisco (above right). 800/452-7925. W&W Glass Systems/Pilkington Planar, Nanuet, N.Y. **CIRCLE 280**

Dome-style original

Ratech specializes in the design, fabrication, and installation of vaulted architectural structures that require spherical, compound-curved, or other shapes. The company recently completed the world's largest dome—180 feet in diameter—located in Reno, Nevada. 702/827-2222. Ratech, Sparks, Nev. **CIRCLE 281**

280



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For more information, circle item numbers on Reader Service Card

KING KONG GROMMET



When you need a very large opening to access all sorts of weird Godzilla-size plugs and cables, the King Kong™ of grommets comes to the rescue! Patent Des. 296,761 and Des. 358,980.

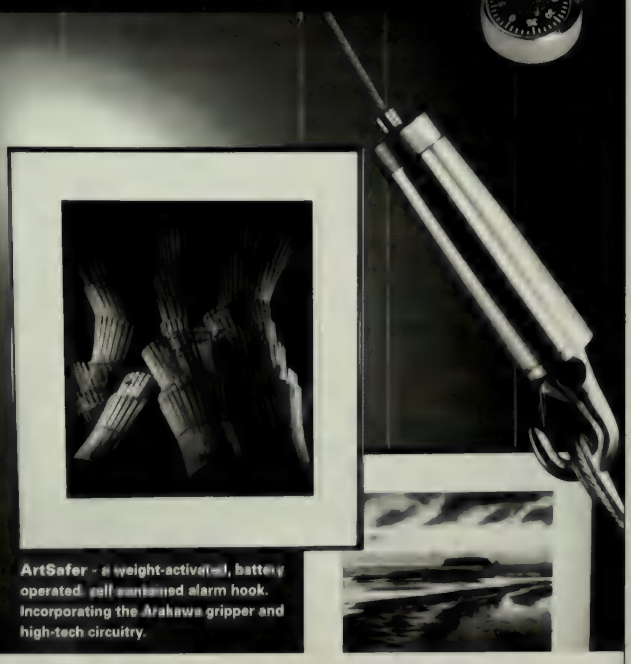
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CIRCLE 42 ON INQUIRY CARD

CONVEYING SYSTEMS Elevators

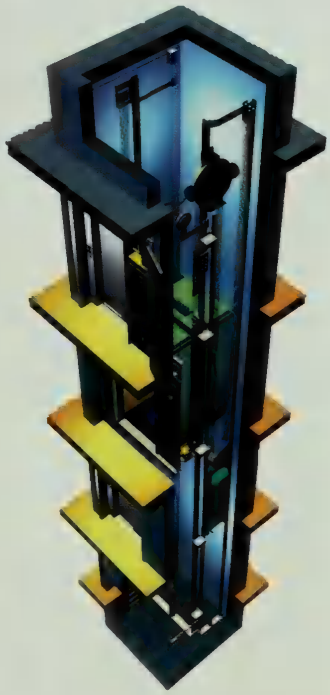
The judges were particularly impressed with the Montgomery-KONE elevator system because of its environmental friendliness: it eliminates the use of hydraulic fluid and reduces energy consumption because of its downsized power supply.

New elevator design

The AC gearless EcoSystem elevator from Montgomery-KONE (far right) is powered by EcoDisc (detail, right), a compact machine disc that integrates the traction sheave, brake flange, and rotor into a single flat, thin design with two independent brakes. The system does not need hydraulic fluid nor does it require additional building space like a penthouse unit. The EcoSystem elevator has a weight capacity of 2,000 to 2,500 pounds (NEII standard platform size); a speed of 200 feet per minute; a standard eight-foot cab; and a seven-foot entrance. 800/956-KONE. Montgomery-KONE, Moline, Ill. **CIRCLE 282**



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CLIP AS AN INQUIRY CARD

MECHANICAL

Plumbing fixtures and features

From a wide variety of products submitted in the mechanical category this year, the judges chose these five because of their commitment to design. From Sieger Design's classic Tara shower to Moen's futuristic faucet and filter, each presents a new way of looking at a product that is usually more concerned with function than with form.

WE LIKE TO SEE PRODUCTS THAT ARE USUALLY CONSIDERED UTILITARIAN BUT ARE ALSO WELL DESIGNED AND THOUGHT THROUGH. —*Steven Goss*

Water filter system

Moen's PureTouch combines a faucet and a filter in one unit. Water can flow unfiltered or, at the push of a button on the faucet's wand, be filtered through a replaceable Culligan cartridge. 800/321-8809. Moen, North Olmstead, Ohio. CIRCLE 283

Open shower

Dornbracht's Tara, an exposed shower system created by Sieger Design, is available in polished chrome, brushed or matte platinum, and brass. The shower is wall-installed with headstand and ring. 800/774-1181. Dornbracht, Duluth, Ga. CIRCLE 284

Temperature reset control

Wirsbo's DuoMix 201 is a two-temperature reset controller for a hydronic heating system. It resets two separate water temperatures using variable-speed injection mixing and primary/secondary piping. 612/891-2000. Wirsbo, Apple Valley, Minn. CIRCLE 285

Bathroom exhaust fan

American Aldes's SV 160 multiport bathroom exhaust fan vents three areas: two at 40 cfm and one at 80 cfm. 800/255-7749. American Aldes Ventilation, Sarasota, Fla. CIRCLE 286

Kitchen faucet control

The new Allegra Linea kitchen faucet from Hansgrohe has a retractable spout and two spray settings: a nonsplash, aerated spray and a needle spray. Allegra Linea is available in four finishes: chrome, chrome/gold, white, and black. 800/719-1000. Hansgrohe, Cumming, Ga. CIRCLE 287



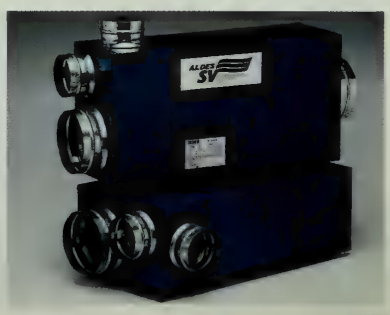
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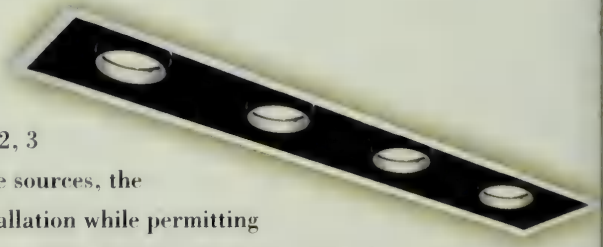


287



Shown with optional accessory cartridge.

A Powerful New Idea In Accent Lighting.



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CIRCLE 46 ON INQUIRY CARD

ELECTRICAL

Lighting products

The jury noted that when it comes to lighting, designers continue to be given a wide range of options. This is true not only in terms of fixture appearance and the types of lamps available, but also in terms of emerging lighting technologies. Among the most interesting developments are those in fiber optics and sulfur lamps.

IN THIS CATEGORY, THERE ARE PRODUCTS THAT ARE IMPROVEMENTS ON EXISTING IDEAS AND THOSE THAT ARE JUST GOOD DESIGN. —Steven Goss



Bendable-stem luminaires

The Curly Torpedo's hand-bendable stem measures 3/16-inch in diameter. The luminaire requires a MR16 lamp and can be accessorized with several different shades. It can also be mounted on a track, from one- or three-point canopies. 773/883-6110. TechLighting, Chicago. CIRCLE 288

Fiber-optic downlight

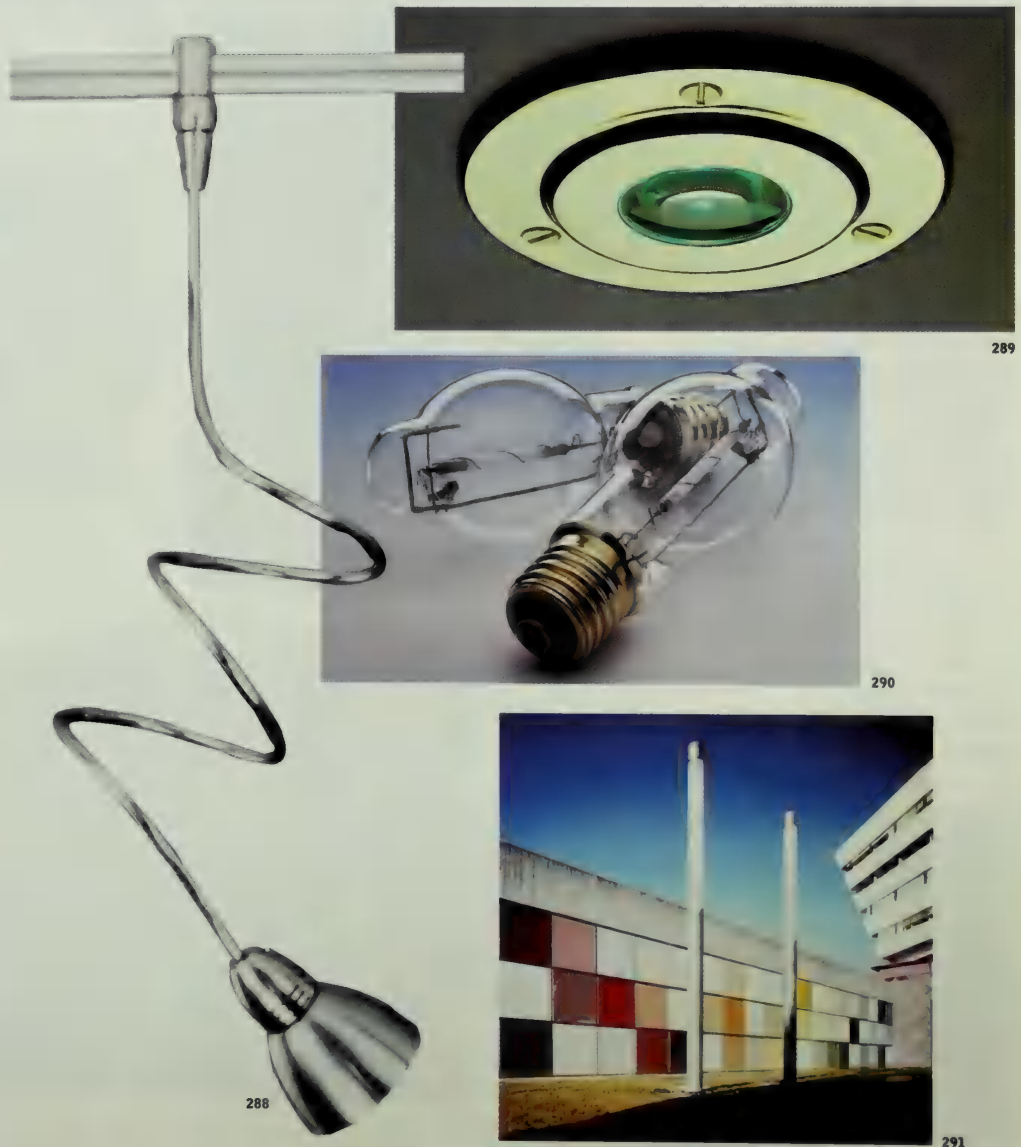
Lucifer Lighting's interior and exterior fiber-optic lighting products now include the Fiber Downlight. Light is supplied to the downlights via fiber-optic cable that originates at a remote metal-halide light source. Once installed, the downlights never need to be removed for servicing. 210/227-7329. Lucifer Lighting, San Antonio. CIRCLE 289

Mercury- and lead-free HPS

Osram Sylvania has introduced a mercury- and lead-free high-pressure sodium (HPS) lamp. The conversion of all HPS lamps currently in use to this technology could eliminate the use of 330 pounds of mercury and 14 tons of lead per year. The direct-retrofit lamps have the same light output as previous HPS lamps in equivalent wattages. 800/544-4828. Osram Sylvania, Danvers, Mass. CIRCLE 290

Outdoor light columns

The Sierra light column by .hessamerica consists of a steel column with an integral base topped by an acrylic diffusion lens. The luminaire is available in 3½-foot, 6½-foot, and 12-foot heights and takes compact-fluorescent or metal-halide lamps. 704/471-2211. .hessamerica, Shelby, N.C. CIRCLE 291



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ELECTRICAL Lighting products

Fluorescent on track

Mobile's three-circuit track can accommodate T8 or T5 fluorescent uplighting and diffused downlighting fixtures, as well as aimable halogen accent lights. The track can be ceiling-integrated, suspended, or span-mounted. The system is ideal for use in spaces that change frequently. Mobilé is the first of LAM's Leuchte series of fixtures to be adapted for the U.S. lighting market. 800/732-5213. LAM Lighting Systems, Santa Ana, Calif. CIRCLE 292



292

Glass fiber light bar

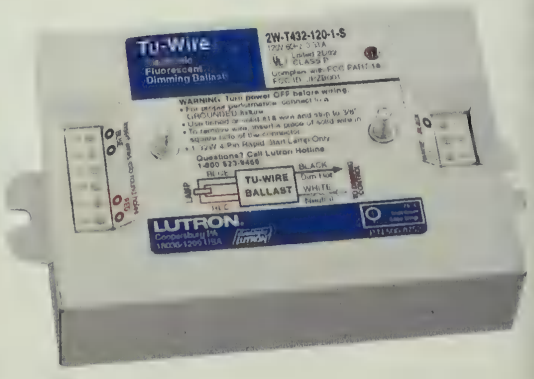
Lighting Services' fiber-optic lighting system consists of a remote illuminator, bundles of glass fiber-optic cable, and light bars and fixtures. The cables do not transmit UV or infrared wavelengths, making the system ideal for illuminating heat- and UV-sensitive objects. Light bars are also useful for illuminating shelves or niches where conventional fixtures would not fit. 914/942-2800. Lighting Services, Stony Point, N.Y. CIRCLE 293



293

Compact-fluorescent dimming

The Tu-Wire compact ballast from Lutron Electronics uses only two wires to provide power and control for dimming of 34W, four-pin, compact-fluorescent lamps. The unit is capable of smoothly dimming these lamps down to 5 percent of full light output without flickering. The unit meets FCC and commercial RFI requirements, and is designed for factory installation into architectural lighting fixtures. 877/2LUTRON. Lutron Electronics, Coopersburg, Pa. CIRCLE 294

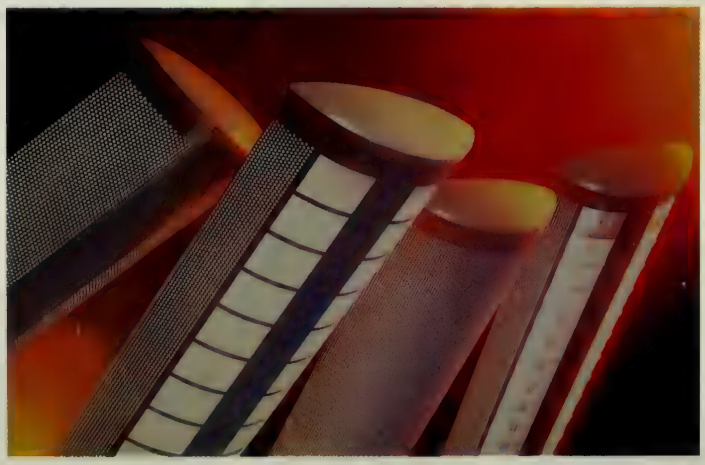


294

Economical suspended series

Ledalite has introduced a series of suspended fluorescent fixtures that are competitive in price with parabolic fluorescent troffers. There are five different fixtures in the line: fully perforated, semi-perforated, perforated with cutouts, perforated with louvers, and fully indirect. A patent-pending linear leveling system helps overcome the problem of sag between mounting points to ensure straight rows. The fixtures are prewired and quickly snap together to save on installation costs. 604/888-6811. Ledalite Architectural Products, Langley, B.C., Can. CIRCLE 295

295



Bivergent direct/indirect

Zumtobel's new La Trave direct/indirect linear fluorescent downlight uses a bivergence reflector for uniform illumination without glare or reflections; the indirect component of the fixture is provided by the reflector's translucent wings. The fixture, developed by the company in response to the need for better lighting in VDT environments, is available in four- and eight-foot lengths, with three or six 32W T8 lamps. 800/932-0623. Zumtobel Staff Lighting, Highland, N.Y. **CIRCLE 296**



296

Post-top luminaire

Kipp is the newest luminaire from Louis Poulsen. Using a flat-top shade, a white internal reflector, and a conical diffuser to shield the lamp, the luminaire provides a uniform, efficient, wide distribution of light. The support arms are made of die-cast aluminum and are available in a natural or painted finish. 954/349-2525. Poulsen Lighting, Fort Lauderdale, Fla. **CIRCLE 297**



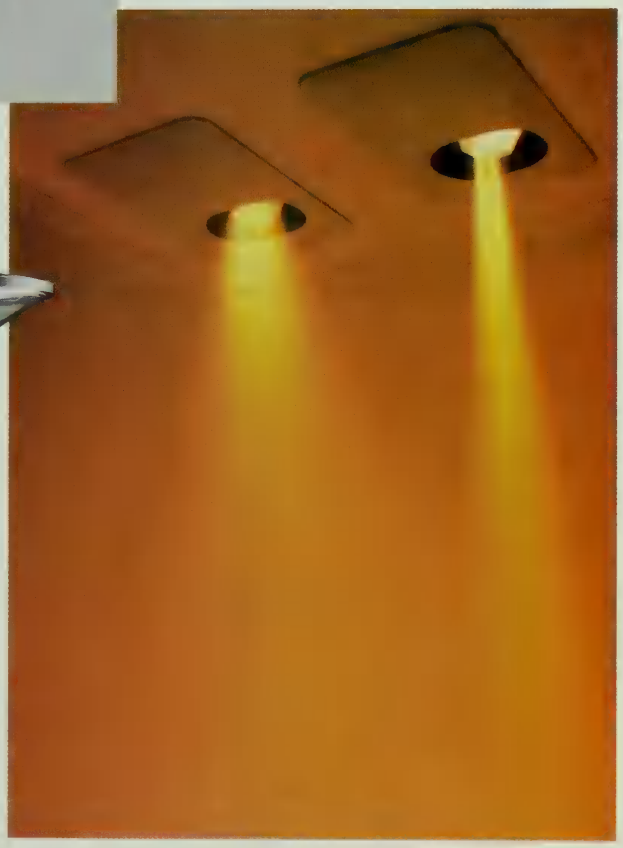
297

Remote source lighting system

3M's Light Pipe System couples Fusion Lighting's electrodeless sulfur-lamp technology with tubes ranging from 13 to 131 feet. The tubes emit bright full-spectrum light continuously along their lengths. The luminaire is located at one end of a polycarbonate tube lined with 3M's Optical Light Film, and a mirror is located at the other end. Light is projected into the tube and reflected out by the film. 800/480-1704. 3M, St. Paul. **CIRCLE 298**

Automated downlights

Irideon's AR6 and AR7 recessed luminaires produce either a hard- or soft-edged beam. With the use of a computer or motorized scanning mirror, the luminaire's intensity, color, and motion can be choreographed. 214/819-3208. Irideon, Dallas. **CIRCLE 299**



299

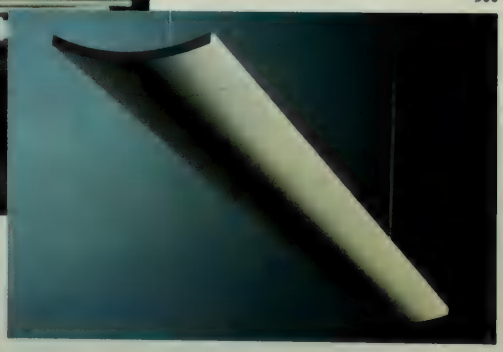
T5 fluorescent uplight system

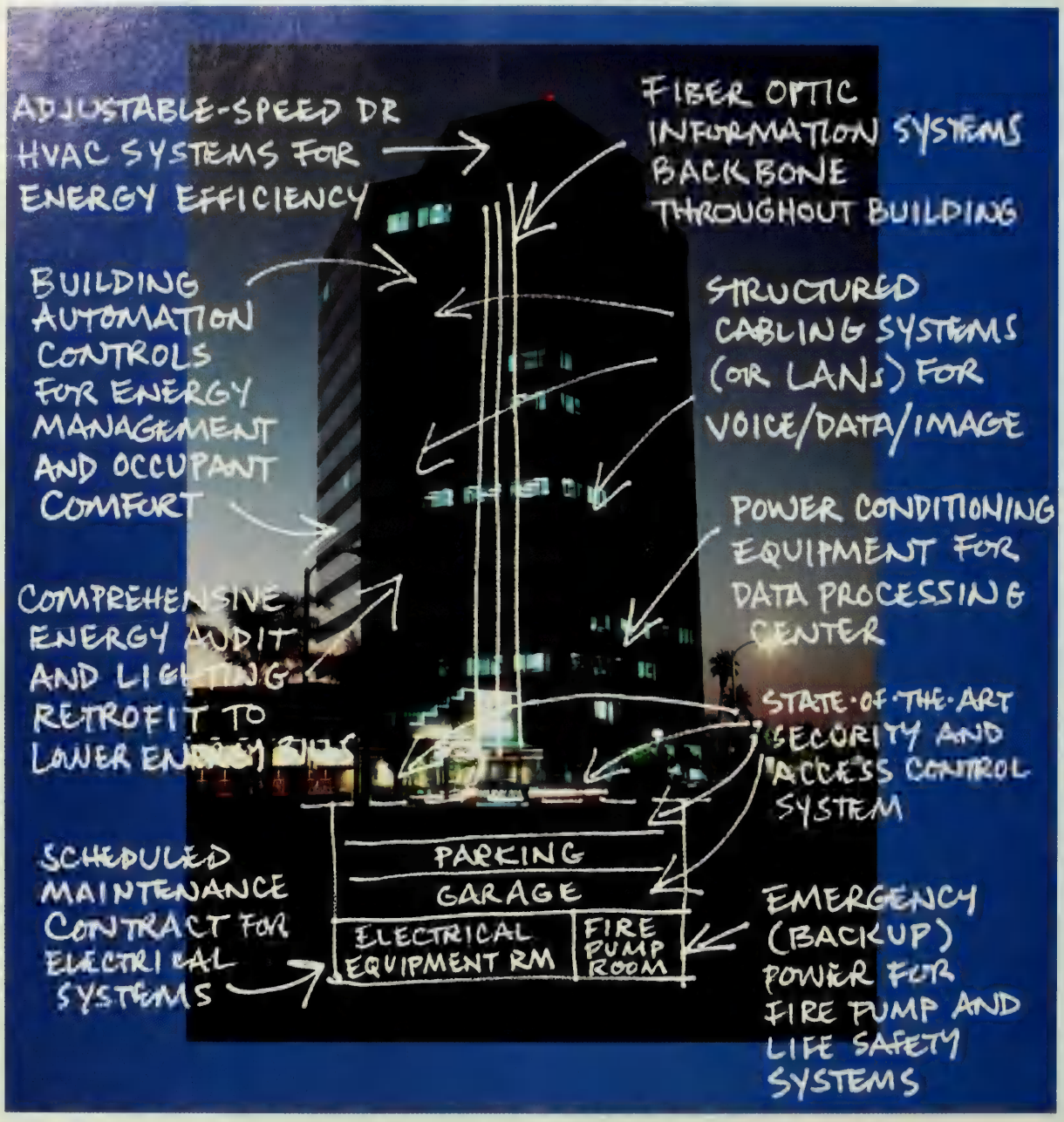
Surf from Artemide is a lighting system made of extruded aluminum that provides indirect fluorescent uplighting with a T5 fluorescent lamp. The Surf system can be wall-hung, suspended, or joined using 90-degree corners and can be finished in white or metallic gray. With Surf's wall-mounted and suspended systems, power can be fed to several modules from a single point. 516/694-9292. Artemide, Farmingdale, N.Y. **CIRCLE 300**



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300





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CIRCLE 49 ON INQUIRY CARD

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Building Comfort with Less HVAC

ARCHITECTS AND ENGINEERS MUST WORK TOGETHER TO REDUCE A BUILDING'S THERMAL LOAD AND DOWNSIZE THE HEATING AND COOLING PLANT.

by David Houghton, PE

Once upon a time, buildings were designed to stay comfortable passively. Thick masonry slowed the transfer of heat, walls were bermed to minimize temperature swings, openings were positioned to take advantage of prevailing winds, and roofs were shaded by overhanging trees. Now that there are chillers, ducts, boilers, and pipes, it's easy to rely on artificial means to keep inhabitants comfortable rather than designing the building itself for comfort. But reducing the thermal load instead of going all out on the HVAC system can reduce construction costs and minimize operating expenses by making more efficient, effective buildings.

Although the heating and cooling of buildings is the province of the mechanical engineer, the architect determines many of a building's thermal properties by selecting its shape, color, layout, and composition. Engineers, who are not often consulted on these decisions, may find themselves literally boxed into designing the size and capacity of the heating and cooling system based on the architect's selections.

"Architects don't think in terms of tons of air-conditioning," says Gary Gardner of Gardner & Pope Architects in Pittsburgh. "It's not in their vocabulary." But developing a mutually challenging partnership with the mechanical engineer means the team works together from the beginning to optimize the building's design. Such an approach, he says, results in greater comfort for occupants and energy savings—something that's increasingly important as more clients ask for energy-efficient buildings.

That said, it's important to recognize that most mechanical engineers are mortally afraid of not providing enough cooling in their designs. Thus, they introduce a safety factor—the amount of installed cooling capacity above the anticipated cooling load. Safety factors are expressed as a percentage of the anticipated load. If calculations show 300 tons are required, 380 tons might be specified instead. The safety factor is 80/300, or 27 percent. However, the load itself, 300 tons in this case, usually includes its own safety factor. This can compound to produce cooling systems that are overdesigned by 100 percent or more, significantly increasing energy usage and equipment costs.



Restoring the original light courts in the 103-year-old Portland (Oregon) City Hall included exposing the roof glazing and the white glazed-brick walls. The courts bring daylight into the offices and create a central meeting place.

Still, engineers know that if there is insufficient cooling, it will be blamed on them. The engineer is therefore liable for corrective action, which may be very expensive. "After a restaurant owner specifically instructed us to cut the cooling equipment down to the bone, he ended up having problems with kitchen ventilation and outside air infiltration," says Jerry Novotny, a mechanical engineer in Boulder, Colorado. "The cost to fix the problem was nearly as much as the entire HVAC system. And there was a lot of scrambling and finger-pointing. It got pretty ugly." While this is a reasonable thing to fear, there is no similar incentive to not oversize, so the safety factor can get quite large. To minimize this wastefulness, architects and engineers need to understand how improving the building's thermal performance introduces a different type of safety factor, one based on the performance of the building itself.

Keeping cool

A building's cooling load is the rate of heat rejection required to keep it cool inside. Conversely, the heating load is the amount of added heat

David Houghton, PE, is president of Resource Engineering Group, a consulting firm based in Crested Butte, Colorado, that specializes in energy-efficient mechanical systems for commercial buildings.

CONTINUING EDUCATION

Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/ AIA Continuing Education article. To receive credit, turn to page 136 and follow the instructions

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. *Work with mechanical engineers to design energy-efficient commercial buildings.*
2. *Recognize areas where mechanical systems are commonly oversized by engineers.*
3. *Compare a building's cooling load to its heating load in terms of equipment, cost, and space.*
4. *Describe sources of thermal load.*
5. *Describe energy modeling.*

needed to keep it warm inside. Of these two, cooling loads are the troublemakers because cooling capacity is more expensive to buy and install; chillers cost more than boilers. Cooling also eats up more building space than heating equipment and costs more to run—pumping 100,000 Btus of heat out of a building with electricity can cost twice as much as adding 100,000 Btus of heat with natural gas, especially during peak load times.

The cooling load, from outside and inside the building, depends on a number of variables, including solar radiation through glazing or thin wall sections, heat gain through the building skin, hot outside air brought in through the ventilation system, lights, people, and plug loads. Commercial buildings need more cooling than heating because they are blocky—internal areas without outside exposure have no windows through which they lose heat in the wintertime .

A useful benchmark for cooling load is cooling density, measured in square feet per ton. If you were to visit 100 commercial buildings and compare their size and the size of the cooling plant, you would find a remarkable cluster at about 350 to 400 square feet of floor space per ton. It turns out that this is the general rule that engineers use; more than 400 square feet per ton and most engineers start getting nervous that there won't be enough air-conditioning.

There are two factors in establishing a commercial building's cooling load. The first is the design load—the worst-case scenario for keeping the building cool. Most engineers use one of several software programs based on the calculation methods of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) to quantify thermal loading based on window area, interior lighting, plug loads, occupancy, and other factors. The program builds a thermodynamic model of the building using an internal library of weather data, then spits out a load report describing the peak heating and cooling loads for the hottest day of the year, assuming all the building's lights and internal devices are running and the building is occupied at peak capacity. A safety factor of 20 to 100 percent is added for good measure. This total, reflecting a situation that will probably never occur, is the design load.

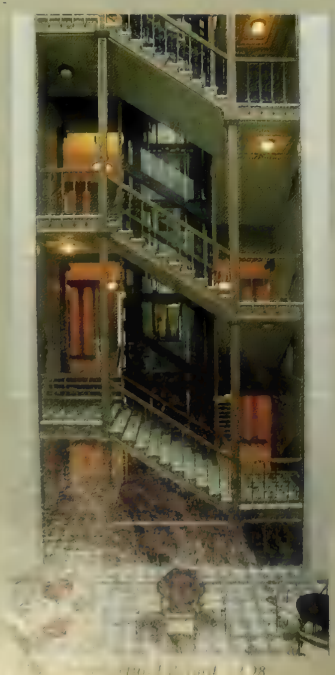
The second, more practical aspect of cooling load is the actual operating load the building experiences throughout the year. The operating load is what actually reaches the chillers much of the time—usually much less than the design load. It's not unusual for a cooling system to operate at 20 to 50 percent of full capacity. This oversizing is expensive. If the cost of a cooling system plant is $1,500 per ton, downsizing one in a 100,000-square-foot building from 250 tons (a density of 400 square feet per ton) to 150 tons (a density of 667 square feet per ton) saves about $150,000.

Energy modeling

Simply downsizing an HVAC system's peak load capacity saves money. But for an accurate picture of where the heating and cooling energy will go before the equipment is specified, architects and engineers are using

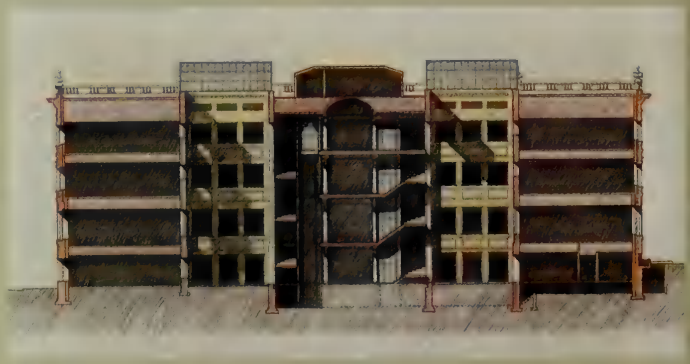
RENOVATING PORTLAND CITY HALL POSES DIFFERENT CHALLENGES

Before renovation, the 103-year-old Portland City Hall in Portland, Oregon, was a maze of dark offices with space heaters, small air conditioners, and fans. Air-conditioning wasn't a huge expense because it was used only in isolated spaces.



"This was not a nice place to work," says Skip D. F. Stanaway, AIA, principal of SERA Architects. An early energy audit, conducted by the project engineers, System Design Consultants, showed that the massive masonry walls radiated cold in the winter. The roof was uninsulated, allowing heat to escape in the winter and enter in the summer. The building had single-pane windows, which opened to the noisy streets for ventilation, and incandescent lights hanging ineffectively from the 13-foot-high ceilings.

The first step was to reopen the building's two central light courts and expose the original white glazed-brick walls that reflected light into the interior. Transoms and lights in the office doors were restored and the light fixtures were fitted with compact fluorescents. Insulation was added to the walls and the roof, and the windows were replaced with low-e-coated insulated glazing. A new air-conditioning system was also installed. *D.H.*





Adding insulation to the roof and walls, replacing old glass with low-e glazing, introducing daylight, and using compact fluorescent fixtures made the Portland City Hall more comfortable.

energy modeling software systems. The best known of these is DOE-2, developed by Lawrence Berkeley National Laboratory in the late 1970s. A new modeling package, EnergyPlus, based on DOE-2, will be available in prototype next year.

Energy modeling software requires time and money to run. Many architects hire consultants who specialize in energy modeling and may charge $10,000 or more to run these calculations. If carefully done, energy modeling provides an accurate and revealing look at the building.

Sandy Mendler, AIA, sustainable design advocate for Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C., used modeling software to analyze the Environmental Protection Agency Campus, a one million-square-foot complex under construction in Research Triangle Park in North Carolina. She was surprised to learn that in the laboratory area of the building, the envelope accounted for a small percentage of thermal load. Because of the high air-change rate required, most of the cooling energy was going out with the exhaust air. In the office portion, however, the building envelope was more significant. That information allowed HOK to allocate its resources appropriately.

Energy modeling is especially useful and accurate for building renovations. System Design Consultants, who served as mechanical and electrical engineers for the renovation of the 103-year-old Portland (Oregon) City Hall, were able to mimic the actual building's performance, making it easy to see where heat was being lost. "We plugged in real numbers based on the building's history, instead of predicting these loads," says Gary Barnes, PE. The resulting design responds to these needs.

Reducing thermal load

There are many sources of thermal load, but the following are the most significant:

Solar load. A building's solar load is determined mostly by its glazing. Often the architectural program dictates the size and placement of glass, and cooling-load considerations take a backseat. By now most architects recognize that glass on the south and west facades of the building introduces heat, while glass on the east side generally provides beneficial morning light and warm-up heat.

Specifying glass with a low solar heat gain coefficient (SHGC), the fraction of solar radiation admitted through a window or skylight, reduces heat gain. The SHGC replaces the shading coefficient as the indicator of a window's shading ability. Glass with an SHGC of 0.20 lets in 20 percent of the solar radiation that strikes its outer face. Most commercial glazing SHGC values are in the range of 0.10 to 0.60; using glass near the bottom of that range keeps cooling loads in check. At the same time, the visible transmittance of the window should remain above 20 percent to avoid a dark and gloomy effect.

Spectrally selective and low-emissivity, or low-e, coatings, which reflect heat, control solar gain while allowing visible light to enter. Tinted

INLAND REVENUE CENTRE COOLED ENTIRELY BY NATURAL VENTILATION

"The most innovative buildings happen when the architect and the engineer start their work together over a blank sheet of paper," says John Thornton, a structural engineer for Ove Arup & Partners in London. Thornton's office, with architects Michael Hopkins & Partners, recently completed the Inland Revenue Centre in Nottingham, England, which is cooled solely by natural ventilation.

The building allows cool air to enter through windows and ventilation grilles, while warm air rises through cylindrical stair towers that act as chimneys and is exhausted through a movable roof. One of the consequences of natural ventilation is greater internal temperature fluctuations than air-conditioning allows. "The occupants cannot expect temperatures to be perfect," Thornton says.

Windows are low-e, triple glazed with integral blinds. Balconies do double duty by shading the office below and holding metal light shelves that reflect daylight into each office. Prefabricated concrete floor panels provide "cathedral effect" radiant cooling. In the winter, the floors hold heat, keeping occupants more comfortable. *D.H.*







Circular stair towers serve as solar-assisted chimneys, drawing warm air upward and exhausting it out of an operable roof. Cooler air is drawn in from the windows and grilles on each floor.

glass which absorbs infrared waves, lessens the amount of heat and light entering a space. Tints, low-e, and spectrally selective glazing allow architects to use more glass without sacrificing thermal control.

Broad eaves, awnings, and other shading devices also reduce solar gain. HOK's Mendler took advantage of the existing tree canopy to shade the western facade of the EPA Campus. "This was one solution that was absolutely free," she says. Deeply recessed windows, light-colored precast concrete, and, most important, light-colored roofing material also help. Hashem Akbari, a researcher at Lawrence Berkeley National Laboratory, says, "Buildings can typically save 15 to 20 percent of total cooling energy if they have a light-colored roof."

IF THERE'S NOT ENOUGH COOLING, THE MECHANICAL ENGINEER IS THE FIRST TO BE BLAMED.

Lighting. A decade or two ago, it was not uncommon to see lighting power densities of two to four watts per square foot. Connected lighting loads in new construction have now dropped to 0.5 to 1.5 watts per square foot, thanks to electronically ballasted T8 and T5 fluorescent systems, an ever-expanding array of compact fluorescent lamps and fixtures, and the decline in overall illumination levels that has accompanied the arrival of computer-based work.

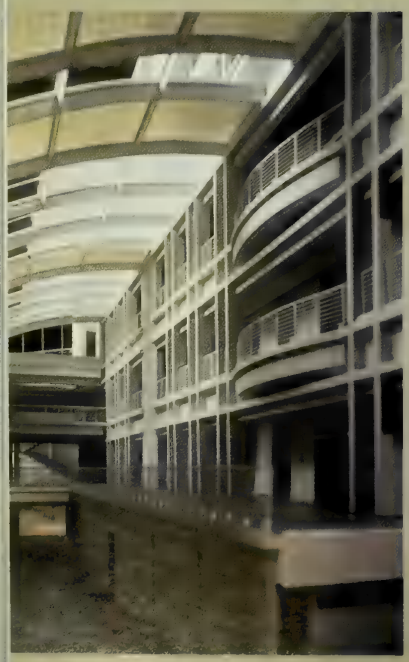
Nearly all the heat generated by lights and other internal loads must be removed by the building's cooling system. Introducing daylighting reduces operating loads, but not the connected load (the building must be operable at night). Few engineers are willing to discount the connected load in their cooling calculations.

Defining a low target for lighting power density—and making sure the engineer uses that value for cooling-load calculations—will make a significant dent in cooling tonnage. "When we tell the mechanical engineer that our lighting load will be one watt per square foot, they often don't believe us," says Nancy Clanton of Clanton Engineering, a lighting design firm in Boulder, Colorado. "There's a fear and trust issue at work here. If there's not enough cooling, the mechanical engineer is the first to take the blame. Why should they take a chance on what we tell them? So they go back to their computer and enter two or three watts. We see it all the time."

Many states now specify maximum lighting power density via the ASHRAE/IES Standard 90.1, Energy-Efficient Design of New Non-Residential Buildings. Some states, including Oregon and California, have their own more stringent requirements. Lighting consultants can also work with the engineer to reduce the lighting load.

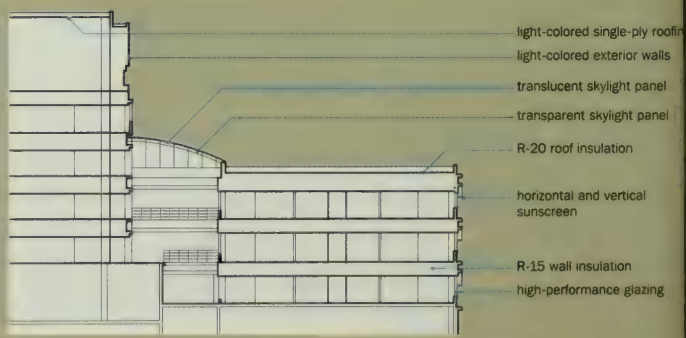
Plug load. A certain mystery surrounds the power density estimates engineers use for plug-in devices, such as computers and copiers. Conventional wisdom holds that as the workplace becomes more com-

DESIGNING AN ENERGY-EFFICIENT BUILDING FOR THE EPA



Since the Environmental Protection Agency is in the business of protecting the environment, designing the agency's campus in North Carolina's Research Triangle Park presented an opportunity to demonstrate responsible energy use. Scheduled for completion in 2002, the building will use 40 percent less energy than a similar design built to "standard practice," says Sandy Mendler, AIA, sustainable design advocate for Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C. Energy consumption by building mechanical systems accounts for about 50 percent of energy costs, Mendler says.

The EPA's Green Lights program outlines efficient use of lamps, ballasts, and smart controls, as well as fixture maintenance. HOK followed these guidelines and used daylighting whenever possible. Subscribing to the agency's Energy Star program reduces plug loads. Low-e, tinted glass with a spectrally selective coating reduces glare and solar gain. Deeply recessed windows and the existing tree canopy provide shade. Light-colored concrete and roofing also reduce heat gain.





Cooling is a tremendous concern at the new EPA Campus being built in North Carolina. HOK used energy modeling software to predict where the building envelope could be improved to save energy.

Energy modeling conducted during the contract documents phase helped the architect and the engineer, R. G. Vanderweil in Boston, see where money would be best spent to conserve energy. "It was important for the whole team to see this," Mendler says. "For an efficient building, we had to work together." *D.H.*

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commercial, plug loads increase dramatically. But many plug-in devices now use less power than ever—inkjet printers use a 20th of the power of laser printers, for example. Most engineers settle on an estimate between two and five watts per square foot, just to be safe.

Unfortunately, a "safe" estimate means oversizing the cooling plant. In an eye-opening analysis, building scientist Paul Komor, writing in the *ASHRAE Journal*, researched actual plug-load measurements. He found that they rarely exceed one watt per square foot. That's because all the electronic equipment in a building is seldom in full use. Shrinking computer storage media and an increasing reliance on laptop computers also reduce plug load density.

People. Population density inside a building affects the design cooling load; each person puts out about as much heat as a 150-watt light bulb. Typical design densities range from 100 to 250 square feet per person, though this depends on the use of the space. In real life, the diversity of work ensures that there are fewer occupants than expected.

Since engineers size for the highest expected density, it's worth checking the estimate to make sure it's reasonable. It should include the number of people who will actually be in the space, as opposed to the maximum allowed by the fire code or the capacity of the parking lot.

Thermal mass. Concrete slabs, stone walls or floors, and other massive building elements, when they exchange heat with the ventilation system or the building's exterior, can buffer peak loads and take advantage of cool night temperatures or warm afternoons. Coupling greater floor mass with night ventilation (which allows cool air into the building when external temperatures drop to a certain level) allowed Ove Arup & Partners in San Francisco to reduce the size of the chiller in an office building by 25 percent. "We always try to use a passive design approach when the owner is interested in environmental issues," says mechanical engineer Sarah Nicholson.

Insulation. Although the insulating value of a building's walls might seem to be a big factor in determining heat gain, it doesn't matter much for most commercial buildings. That's because cooling load is dominated by internal loads and solar gain. Also, there isn't much temperature difference between a 75-degree space and the 95-degree outdoors. Insulation does, however, have an impact on winter heating load. Then temperature differentials between indoor and outdoor air can easily reach 60 or 70 degrees. A typical wall section providing R-19 performance is good enough for most applications. Roof insulation is crucial, since the sun beats on the roof all day. For large single-story buildings in southern climates, heat transfer through the roof can amount to as much as 30 percent of total cooling load, and higher insulation values are warranted.

Engineers as friends

Aside from making better design decisions, architects can work with engineers to avoid oversized HVAC systems by expressing interest in the central plant design. If the engineer knows that the architect and the owner want a realistic system, instead of one that guarantees the absolute comfort of occupants, everyone can work together more responsibly. "Let the engineer know that oversizing is not acceptable," Clanton says.

Architects can help by providing accurate occupancy and plug load estimates. Postoccupancy measurements of previous buildings provide some real-life examples. Willingness to work with the engineer, to approach the liaison as a way to solve problems and save money, will mean a better, more comfortable building and a happier owner. ■

AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- **Read the article "Building Comfort with Less HVAC" using the learning objectives provided.**
- **Complete the questions below, then check your answers (page 158).**
- **Fill out and submit the AIA/CES education reporting form (page 158) or file the form on ARCHITECTURAL RECORD's Web site at www.archrecord.com to receive two AIA Learning Units.**

QUESTIONS

1. What are the two factors that are used to establish a building's cooling load?

2. Why is the cooling load a larger problem than the heating load in designing energy-efficient mechanical systems?

3. What is energy modeling?

4. How could you reduce the thermal load on a building?

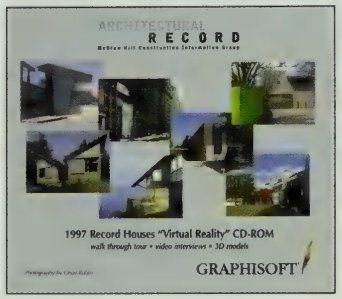
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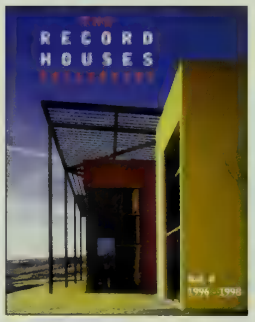
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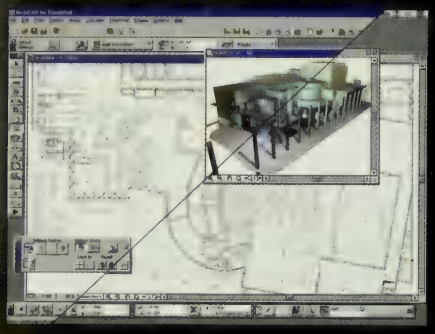
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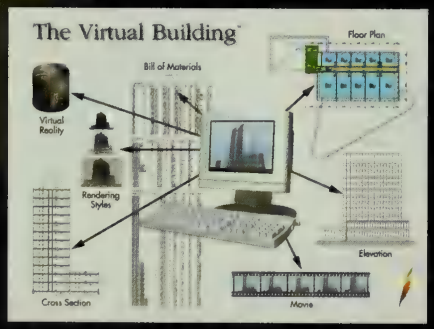
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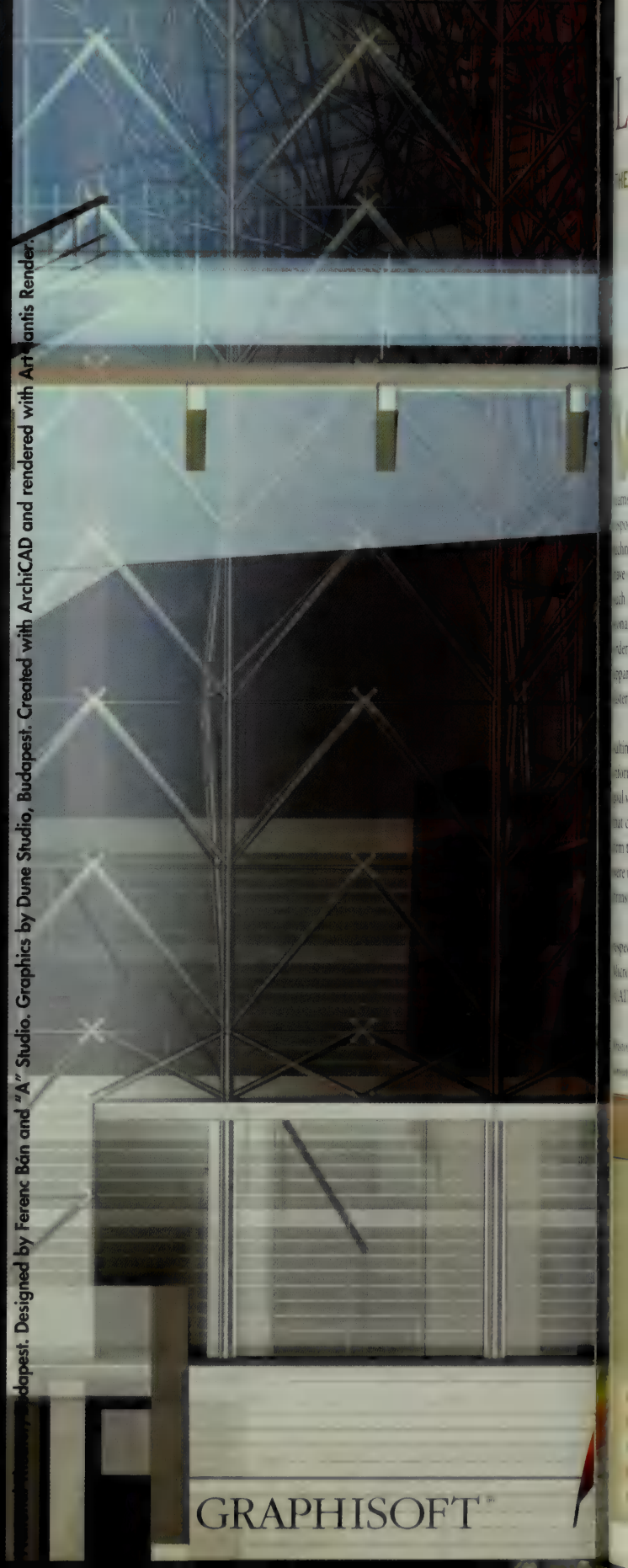


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Look for Higher Technology Benefits

THE REAL ADVANTAGES OF COMPUTER TECHNOLOGY TO AN ARCHITECTURAL FIRM OFTEN GO FAR BEYOND THE EXPECTATIONS AND PERCEPTIONS OF THE FIRM'S MANAGEMENT.

by Kristine K. Fallon, FAIA

"We aren't taking advantage of half the technology we already own," is a common complaint among firm principals when they receive requests for more hardware or software expenditures. Those making the request—typically design teams seeking to meet the needs of a client—are frustrated by this response because, often, a firm is reaping greater benefits from its existing technology investments than its principals realize. Most design teams have moved beyond readily quantifiable, task-level productivity gains, such as spending fewer hours on each drawing, to higher-level professional gains, including better cost estimates and reductions in change orders and errors and omissions. These gains, though not always readily apparent to the principals, indicate that the firm is not just doing things faster and cheaper, but also better.

Earlier this year, Kristine Fallon Associates, a computer consulting firm, concluded a client-sponsored study to document the best information technology (IT) practices among architectural firms. The goal was to find real-world best practices demonstrating business results that could be emulated. Although the study was conducted for a single firm that is growing rapidly and whose principals wanted to insure they were making good use of their technology, the results are applicable to all firms with computers.

The firms that participated in the study are similar in many respects. All design general building types; all use Intel PCs running a Microsoft Windows operating system; and all use computer-aided design (CAD) software, although some firms use more than one CAD system.

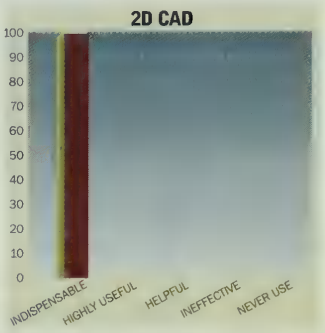
Kristine K. Fallon, FAIA, is president of Kristine Fallon Associates Inc., a computer consulting firm in Chicago.

Firm size ranges from 22 persons to one with 700 employees and offices worldwide. To explore these issues in the kind of depth required, anonymity was required by the participants. What follows are not only the results of the study, but also our observations, extrapolated from the results.

Getting to know them

The study consisted of a two-part survey and interviews. One part of the study concerned the quantifiable aspects of the firms' computer operations: what software products they are using; the technical specifications for their hardware; what types of electronic data they exchange with consultants and owners; and to what extent they are using the Internet. This portion of the survey was directed to the person in the firm in charge of the day-to-day management of the computer systems.

The second was a management survey that was intended to elicit the principals' perceptions of the effects of computer use on their businesses. Principals were asked to judge the importance of a variety of computer applications to their businesses on a sliding scale from "never use" to "indispensable." This portion of the survey also proposed a number of potential technological benefits, which the principals were also asked to rate.



Principals clearly recognize the value of CAD software. It saves time and it saves their clients money.

PRINCIPALS SURVEY: HOW IMPORTANT ARE THESE TECHNOLOGY APPLICATIONS TO YOUR PRACTICE?

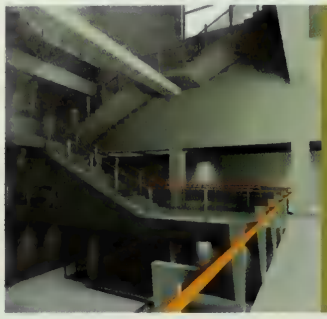
	2D CAD	3D MODELING	PHOTOREALISTIC RENDERING	ANIMATION	IMAGE PROCESSING	DESKTOP PUBLISHING	DATABASES	CONTACT MANAGEMENT	PROJECT SCHEDULING	ELECTRONIC DATA MANAGEMENT	FACILITY MANAGEMENT	COST ESTIMATING	CUSTOM SPREADSHEETS	ENGINEERING	CD-ROM PRODUCT DATA	ONLINE PRODUCT DATA	E-MAIL	WORKGROUP APPLICATION	WEB SITE CREATION/MAINTENANCE
INDISPENSABLE	100%	17%	17%	0%	33%	33%	50%	50%	33%	17%	17%	50%	50%	50%	0%	0%	50%	0%	0%
HIGHLY USEFUL	0%	67%	33%	0%	33%	17%	17%	0%	50%	33%	17%	17%	0%	33%	33%	33%	33%	0%	17%
HELPFUL	0%	0%	50%	67%	33%	17%	33%	0%	17%	0%	17%	17%	0%	17%	50%	50%	0%	33%	17%
INEFFECTIVE	0%	17%	0%	0%	0%	17%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
NEVER USE	0%	0%	0%	33%	0%	17%	0%	0%	0%	33%	33%	0%	33%	0%	17%	17%	17%	33%	50%

Principals were asked to evaluate the use of computer technology and its benefits within the firm. What was surprising was the number of principals who did not grasp the high-level benefits—including cost savings—that computers provide.

* FIGURES THAT DON'T ADD UP TO 100% INDICATE A LACK OF RESPONSE

SOURCE: KRISTINE FALLON ASSOCIATES, INC.

The final and most revealing part of the study was the in-depth interviews conducted with one project team from each of the participating firms. In these interviews, a standard set of questions was used to determine each team's view of project phases and work processes, how well the firm's hardware and software served their projects, the extent to which electronic communications extended to outside consultants, the perceived benefits of computer use, and the quality of the technology training and support they received.



THE EFFECTIVENESS OF A COMPUTER SYSTEM IS THE DEGREE TO WHICH IT CONTRIBUTES TO THE REALIZATION OF BUSINESS GOALS.

Surprising results

One of the most successful projects, measured by the way computers were used in the design and construction process, was a building designed in the early '90s using a CAD package that did not support reference files—the CAD equivalent of overlay drafting. Without the reference-file feature, the usual practice was to include the architectural base-plan information in the CAD plans of the engineers, landscape architects, and other disciplines participating in a project. This approach was not much different than manual drafting in that every time the architects changed the base plan, everyone had to be notified and every drawing that contained that architectural information had to be updated. In short, there were many opportunities for errors.

But the successful project's team included a CAD expert/programmer who saw the limitations of the system and developed a program that permitted the electronic versions of architectural base plans issued to the other members of the team to be automatically updated when they were revised. The programmer also customized the CAD program to ensure that the project's layering standards were enforced. Team members reported that this degree of automation made it easier to communicate changes among the design disciplines, reduced rework, and, most important, let the team focus on the architecture instead of the logistics. The project manager was adamant that this customization was a major factor in reducing errors and omissions to less than 1 percent of the construction cost.

Yet what is truly remarkable is that this firm's principal, responding to the second portion of the survey, said that he did not know whether the technology used by his firm reduced errors and omissions. This startling admission was, in fact, consistent with the findings of the survey as a whole. Project teams almost uniformly reported improved results with greater technology. And not a single one of the principals interviewed strongly agreed that computer use provided a reduction in the number of field change orders, the cost of these change orders, or the percentage of errors and omissions. Many principals said they were forced into using CAD by their clients. The principals perceived the technology as an annoyance and delegated its management to relatively junior staff, who typically had little understanding of the business of architecture and were unable to identify the performance metrics that really count.

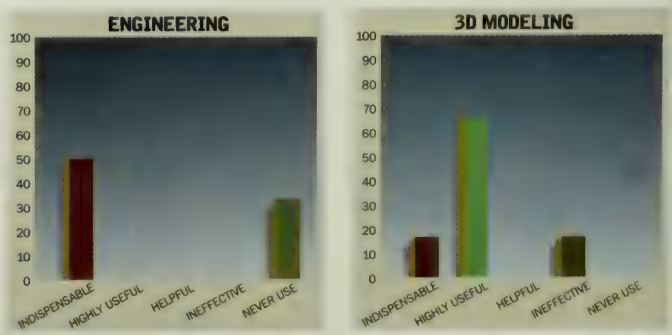
The lesson is clear. Principals must strive to understand how technology is benefitting their employees and their firms. Conversely, the firm's technology users need to communicate directly with their principals about how technology contributes to their work and the results they achieve with it. In a broader sense, the design firm as a whole needs to align its use of computer technology with its business goals. This requires the thoughtful participation of the principals and their active support of new technology initiatives. Though it may seem ironic, the true measure of the effectiveness of a computer system is the degree to which it is perceived by managers or others to contribute directly to the realization of business goals.

Training and support at the project level

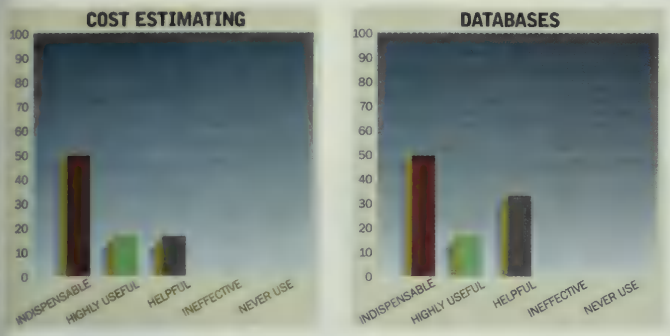
The study revealed three different approaches to technology training and support. The first involved no dedicated computer support and no in-depth technology expertise; informal peer training was the norm. This situation was typical in firms with fewer than 40 people, and it proved to be the least effective. Smaller firms need a technology partner who can provide expert technology evaluation, customization, training, and troubleshooting when needed.

The second approach involved a dedicated computer staff that offers generalized technology training, rather than training within the context of a project. Many firms rely on outside sources for technology training and many of these sources provide excellent instruction. But most people still need help fitting the tool to the work process, and a CAD class will not include instruction in the firm's standards and procedures.

The third and rarest approach involved computer specialists participating as full-time members of the project team. Only one team had a full-time computer specialist, while another team involved IT staff in project-specific software customization. These were the two teams that identified the use of CAD as adding significant value to the design process



Coordinating technology exchange among different disciplines is problematic for most firms, as the engineering chart demonstrates. But principals are catching on to the effectiveness of 3D modeling.

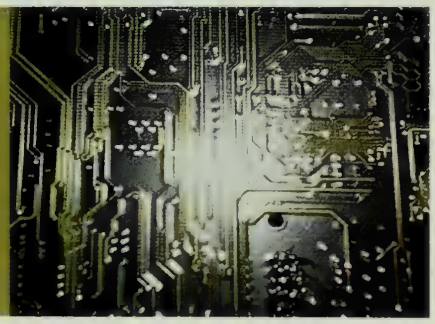


The value of estimating and database creation are clearer to the principals of the firms who were surveyed than the more subtle advantages of computer technology, such as access to online product data.

and streamlining communication and coordination activities.

How technology support and training are delivered makes a difference in a firm's ability to utilize technology. The one project team with the dedicated programmer/trainer/support person was by far the most effective in its computer use. It was also the only team that rated computer use as "highly effective" throughout all project phases. This team received two types of training: basic CAD, and instruction in the use of the project-specific customization and standards. Since the project had dedicated technology support, this training was available as needed. This example seems to prove that preparing employees to do things right the first time enhances performance and morale.

CLIENTS ARE BECOMING MORE DEMANDING ABOUT THE WAY A PROJECT IS MANAGED ON THE COMPUTER.



Plan automation for each project

The uses and benefits of technology vary on different types of projects. Firms can benefit by exploring how information technology can be applied to their specific jobs. This process, referred to in the technology consulting business as "automation planning," simply means principals and their staff must think about the technology appropriate to the project at hand and be ready to implement it early in the process. The launch of a major project is also the time for a firm to consider a stronger commitment to software or a major technology purchase.

Automation planning requires the participation of those who know the intimate details of the project's requirements, teaming arrangements, and contractual terms. It also requires input from computer specialists. The first must articulate the business issues, and the latter must judge the feasibility of various IT solutions.

An excellent example, though it is not taken from the study, is the technology planning undertaken for the Spallation Neutron Source project at Oak Ridge National Laboratory. This is a $1.33 billion project designed to meet the needs of the scientific and industrial research communities into the next century. While the conceptual design for the project has been under way since 1996, this summer, the Department of Energy announced that the facility design/construction management contract was awarded to a joint venture of Lester B. Knight & Associates in Chicago and Sverdrup Facilities in St. Louis. The scope of work explicitly requires the design team to use 3D computer-aided modeling; to include sufficient information in the models to permit the extraction of equipment lists, a bill of materials, and drawings; to integrate the 3D models of the scientific equipment already under development at the various national laboratories; and to use the Internet for design collaboration. Schematic design of the facilities is scheduled to begin in the next few months.

While these technology requirements may be more extreme than most, they also show that clients are becoming more demanding about the way a project is managed on the computer. By the time Knight & Associates was notified of the award, the company had already conducted a preliminary computer technology assessment. They also scheduled their own "technology day" when vendors would come in and demonstrate various products to them. Also, key personnel from all of the design and construction team, as well as the client, convened for a full day this fall to evaluate state-of-the-art products for 3D modeling and electronic project communication—the first step in a thorough technology planning effort that will include a 3D modeling pilot program, comprehensive specifications of the hardware, software, and communications components required in each office, work process analysis, definition of training requirements, and the development of project data standards and procedures for electronic collaboration.

In contrast to the principals interviewed in the study, management, in this case, is not only championing the technology plan but leading the way. "Intelligent, early planning is required for successful technical and financial results on any project we start these days," says Robert H. Mellott, AIA, of Knight & Associates, design manager for the joint venture. "However, for projects like this one, with a three- to four-year design life, the information technology we select must be able to be integrated with new products as advances in technology occur. The selected software and communications systems must support our customer's objectives for interaction with our design process, and the design data must be usable by the owner for facility management after our work is complete."

In architecture, as elsewhere, it is the business requirements that must drive technology adoption. But the whole team must think creatively to imagine how various technology products can be focused to meet their specific project challenges.

Recycled content

One of the great advantages of information technology is the ability to reuse information. Every firm has grown accustomed to cutting and past-

ing bid proposals. Similarly, reusing CAD data can be a very successful strategy, the study found. The successful team cited above that held errors and omissions to less than 1 percent of construction cost focused on the ability to automatically reuse the architectural base plan information in the drawings of all the design disciplines. The key to this type of information reuse is CAD standards, particularly layering standards, that work for and are adhered to by all disciplines and outside consultants.

The majority of project teams interviewed were unable to share CAD information easily with outside consultants because each firm created its own CAD standards. These met the needs of the individual firm, but did not accommodate other team members.

Industry-wide standards that accommodate all disciplines are necessary in order for the design industry to reap the full benefits of electronic communication. Such standardization would not only streamline CAD operations within firms, but also allow a new team member to effortlessly plug into the data flow. An important start to this process is the AIA's Layer Guidelines, which provide recommendations for organizing CAD data into both files and layers, with naming conventions for both. Originally issued in 1990 and revised in 1997, the guidelines cover engineering, architecture, and interior design. It is also one of the foundation documents for the National CADD Standard, now being developed under the auspices of the National Institute of Building Sciences. Besides layering and file naming, this standard will cover drawing-set organization and sheet-file naming, sheet organization, schedules, plotting guidelines, and drafting conventions (including notations, symbols, diagrams, scale and linetypes, and attributes).



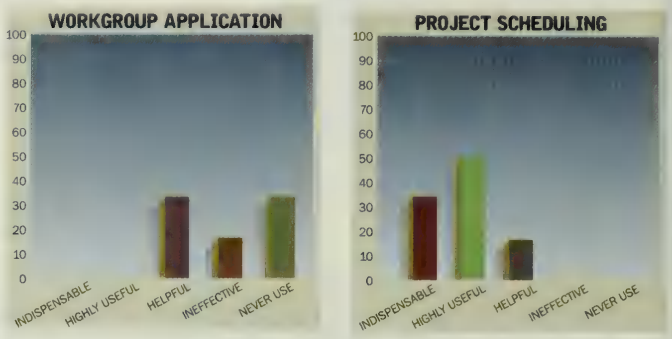
STANDARDIZING CAD WOULD ALLOW NEW TEAM MEMBERS TO EFFORTLESSLY PLUG IN TO DATA FLOW.

Another kind of information reuse is the ability to transfer portions of drawings or details from one project to another. Two of the projects in the study involved building prototypes. These projects experienced reduced design costs—savings of 50 percent in design development and 40 percent in construction documents were recorded by one team—by transferring information. They also achieved better conformance of actual bids to cost estimates.

CAD STANDARDIZATION

- File names and contents
- Restricted entities—what entities to use instead
- Reference-file handling
- Layer names and contents
- Plotted line weights
- Line fonts
- Text fonts and sizes
- Units
- Drawing precision

Outside of these prototype projects, however, information reuse was not very effective. Although most teams borrowed some information from previous projects, the process was hampered by a lack of CAD standards. CAD files required extensive reworking to produce drawings that were consistent in terms of line weights, text heights, and dimension styles. This diminished the benefits of their reuse. Also, access to reusable information depended on an individual's knowledge of other projects, rather than on an official library of details or an electronic search capability. No guidance existed to distinguish good details suitable for reuse from less successful ones.



Once again, the difficulties in communicating to the various disciplines involved in a project is evident in the first chart. But the advantages of project scheduling on the computer are clear.

Facility management and maintenance is another important application for the reuse of information. However, none of the participants in the study had attempted to apply their experience in CAD reuse to this area.

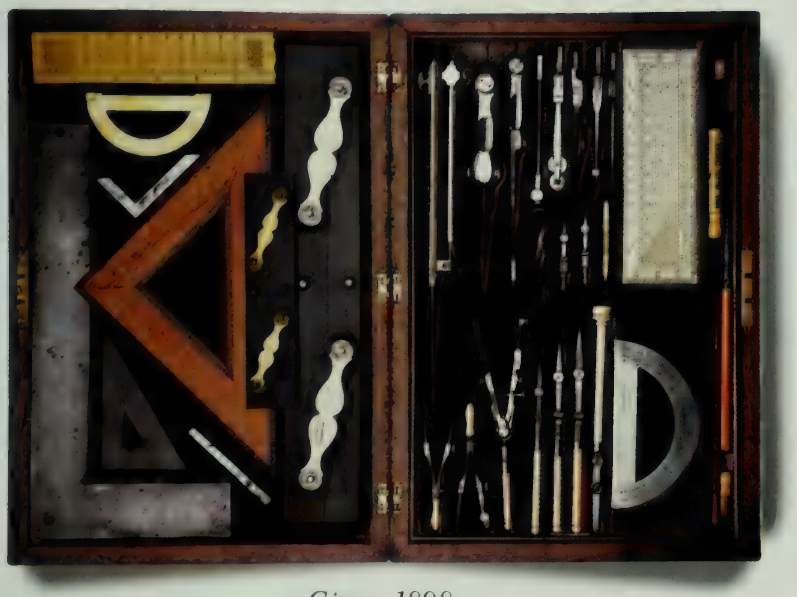
The future of technology

Object-based, intelligent 3D modeling systems will become even more important in the next generation of CAD products. Object class libraries, now under development by the International Alliance for Interoperability, an organization of software vendors, manufacturers, professional organizations, and consulting firms, will become more vital. These classes will provide a basis for sharing information throughout the construction project's life cycle and across disciplines.

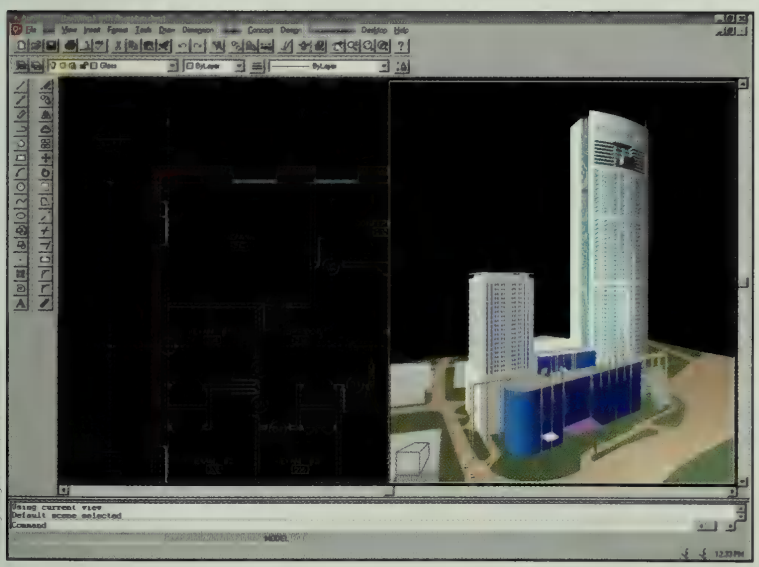
As the more avant-garde CAD systems have demonstrated, design teams will soon be creating computer-based 3D facility models from an assembly of objects. An object will incorporate physical information such as material, color, electrical or thermal properties, and a definition of how it should appear within a space. An object may also encapsulate procedures that can be used to describe how it should relate to other objects—a light switch may record its required height and distance from a door.

It is said that electronic communications can eliminate advantages of size and allow small companies to compete effectively. The typical architectural firm is ready for this; most are small, nonbureaucratic, and full of creative, imaginative people. These firms are poised to compete successfully in the information age, where business strategy will increasingly demand flexibility, creativity, collaboration, and intuition. ■

The state of the art in architectural tools.



Circa 1898



Building image courtesy of Anshen+Allen

Circa 1998



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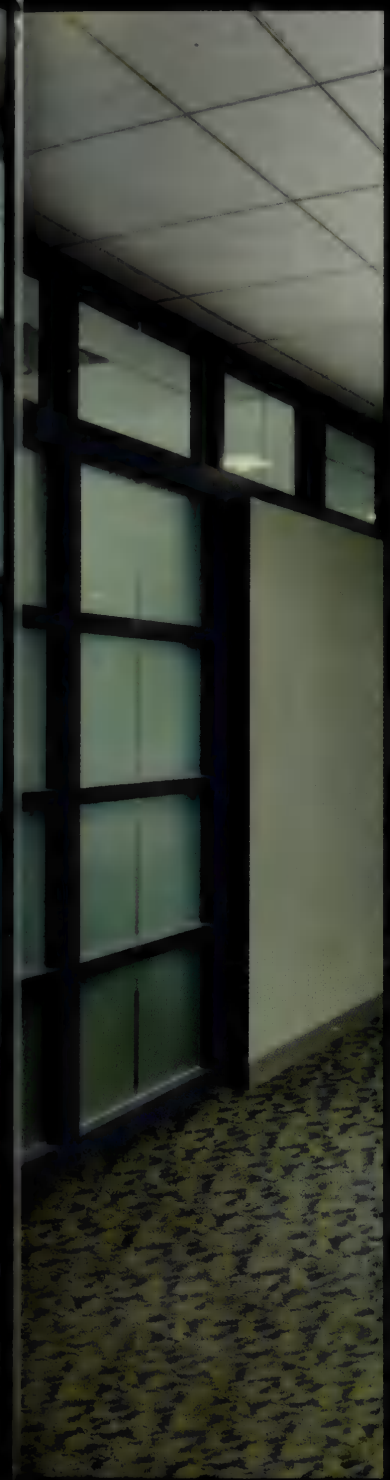
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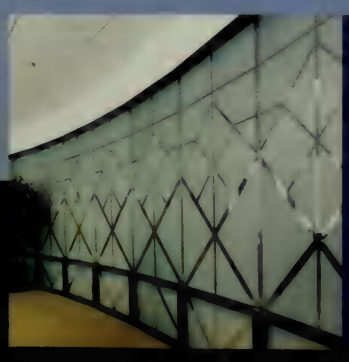
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VERSATILE ALUMINUM WINDOW AND DOOR FRAMES: THE MATERIAL OF CHOICE FOR INTERIOR APPLICATIONS

VERSATILE ALUMINUM

As you walk down any street in any major city, you have to appreciate the role of aluminum in shaping the modern urban environment. Take a moment to note that aluminum is often the material of choice for the framing of exterior entrance doors, windows and curtain walls. It's difficult to imagine the skyscrapers of today in all steel or wood.

As you will learn through this continuing education opportunity sponsored by United States Aluminum, RACO Interior OfficeFronts™, aluminum is a material with special characteristics that make it highly versatile for the construction industry. Most recently, this unique material has penetrated the interior environment and is now used widely for window and doorframes.

MATERIAL ADVANTAGES

Why aluminum? A unique combination of light weight, strength, corrosion resistance, electrical conductivity, heat reflectivity, formability, and suitability for a wide variety of durable finishes makes aluminum the most versatile metal used in building construction.



A frosted glass and aluminum frame provides privacy for a conference room at First U.S.A. in Dallas. Designed by The Lauck Group.

Start with its corrosion resistance. Aluminum's corrosion resistance comes from the metal's naturally occurring oxide coating. As soon as it is exposed to air, the newly smelted metal forms a hard, tightly bonded, glasslike surface film, which protects the interior. If scratched, the newly exposed aluminum surface immediately reforms a protective oxide coating.

The addition of alloys to the raw metal improves aluminum's performance across the entire spectrum of desirable properties—improved strength, corrosion resistance, flexibility, ductility, workability and weldability. Again, think of where you find aluminum—as door and window frames and curtain walls exposed to exterior weather conditions.

AIA / ARCHITECTURAL RECORD
Continuing Education Series

Use the learning objectives below to focus your study as you read *VERSATILE ALUMINUM WINDOW AND DOOR FRAMES.* To earn two health, safety, and welfare learning credits, answer the questions on page 150 and follow the report instructions on page 158 or use the Continuing Education self-report form on *RECORD*'s website www.architecturalrecord.com.

Learning Objectives

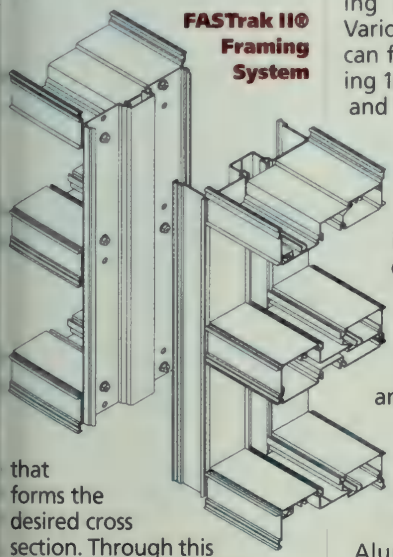
- Describe how use of aluminum aids construction time.
- Discuss why aluminum is considered a versatile building material.
- Explain how the use of aluminum is good for our environment.
- Identify the versatility of aluminum window and door frames in specific applications.

This continuing education opportunity is brought to you by United States Aluminum Commercial Products Group, RACO Interior OfficeFronts. United Sates Aluminum offers a full range of aluminum entrance doors, storefronts, window walls, curtain walls, and slope glazing systems for both interior and exterior design. In 1998, the company acquired RACO, a company that for 26 years has manufactured interior door frames and glazing systems for commercial construction. The addition of RACO Interior OfficeFronts offers architects and designers a single resource to fully utilize the unique structural properties of aluminum for both interior and exterior design. All glazing systems are tested to the highest industry standards by certified independent testing laboratories. Comprehensive details, installation instructions, and test reports are available for each system.

Advertising Supplement Provided by United States Aluminum

Aluminum is shaped by a brake press or an extrusion press. Simple low-volume aluminum profiles are usually done on a brake press. Shapes of greater intricacy are put through the extrusion process.

Basically, the process of extruding aluminum consists of pushing aluminum alloy metal through a die to give it its unique shape or profile. In more technical terms, aluminum billets are heated in an 800° F furnace to a plastic state and pushed by a hydraulic ram through a die that forms the desired cross section. Through this process the following are made: Fins, grooves and other projections or indentations for glazing, thermal breaks, air-pressure-equalizing channels and other features.



DESIGN PROPERTIES

The extremely intricate profiles of extruded aluminum make the material ideal for interior office fronts. This is most readily seen in the face profiles available as standard on many systems. (The face profile is the side of the extrusion viewed by a person looking perpendicular to the doorframe or window.)

In fact, one window may have many face profiles on it. For example, the verticals may have 1 1/2 inch face profile with the head having a 4-inch face profile, the intermediate horizontal having a 3-inch face profile and the sill having a 5-inch face profile. Yet, the frame's appearance is quite crisp having been through the extrusion process. The same principles hold true for large horizontal mullions.

Instead of being raised above the framing with applied stops, the glazing pocket on interior window and door frames is recessed. This eliminates the need to have exposed screws showing on the applied stop. Various thicknesses of glass can fit in the pockets, including 1/4 inch, 3/8 inch, 1/2 inch, and 9/16 inch.

CONSTRUCTION FEATURES

The construction of interior wall and window frames needs to be considered in two parts. The first is the timing of the construction of the partitions and the attachment of the door frames and the windows. The second is the actual assembly or building of the door frames and windows. Aluminum window and door frames are designed to expedite the construction process.

Often, timing is of outmost importance is finishing a construction job. The juggling act of when to order and build can be simplified through the use of aluminum door frames and windows. Unlike welded steel, aluminum frames can be installed after the walls are built and painted, and even after the floor is carpeted. Also, most welded steel frames are painted in the field, adding time to the construction process. Aluminum door frames and windows are factory finished, and so completely eliminate this type of field finishing delays.

Available door frame and window assemblies vary greatly among manufacturers, ranging from receiving stock lengths that are cut and assembled in the field to receiving preassembled units ready to go into the drywall opening. Obviously, the units that are received assembled shorten the field installation time.

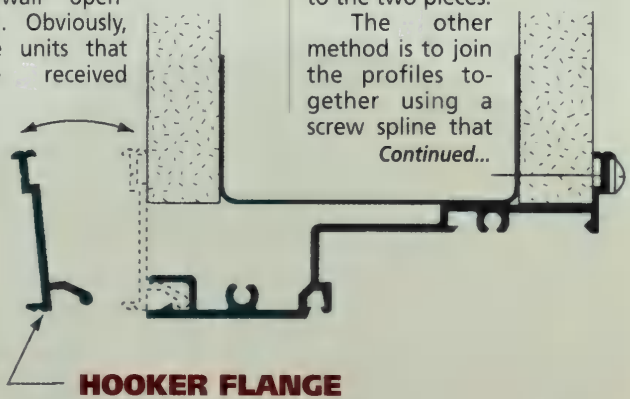
The method of joinery of the door frames and windows affects the construction time. The most common method of joining two profiles together is with clips that are screwed to the two pieces.

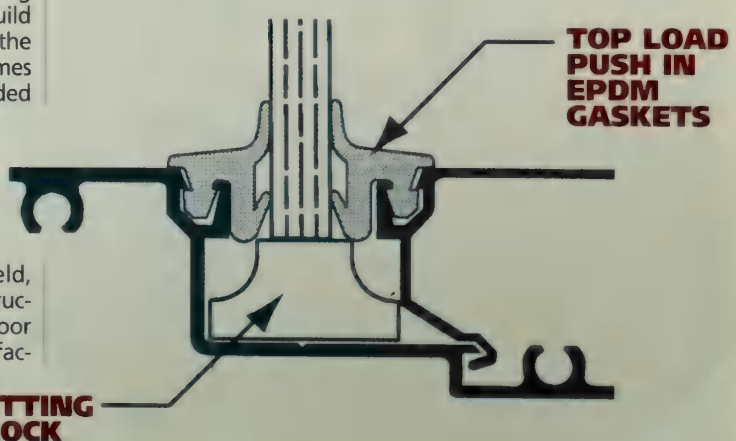
The other method is to join the profiles together using a screw spline that

Continued...

ALUMINUM FACTS

- **The most abundant metal in the earth's crust, aluminum is called alumina in its natural oxide form. The most common form of aluminum ore is Bauxite.**
- **The use of aluminum grew after Charles Martin Hall the in U.S. and Paul L.T. Heroult in France almost simultaneously invented the industrial electrolysis and the electrochemical liberation of aluminum from its ore. High strength, heat-treated aluminum alloys were developed during WWI and in 1920 came the development of two critical production processes—anodizing and extruding.**
- **The most common alloy for shaped building materials is 6063 T5. In the 6000 series, magnesium and silicon are added to create an alloy with enhanced formability, weldability, and strength.**
- **Nearly 30 percent of the total U.S. aluminum supply is derived from recycled scrap.**







An intricate pattern and contrasting black aluminum frame with frosted glass. The system fronts a conference room at Nestle USA in Glendale, Calif. Designed by CHA Architects.

is extruded into one of the two shapes. Then the two shapes are simply screwed together, a much simpler method requiring less expertise by the assembler and the installer.

In comparison, the clip method requires the assemblers and installers to be trained in that particular system.

A new innovation in aluminum door frame and window systems are units that can be assembled and then fit into the dry wall opening 100 percent of the time. This is possible because of a detachable flange that is attached to the door or window frame after it is in place. The result is a full-throated framing system identical to the systems that do not have the detachable feature.

THE ENVIRONMENT

Recycling is an integral part of processing aluminum. Most aluminum alloys contain scrap aluminum, as much as 50 percent scrap. In fact, the larger aluminum door frame and window manufacturers have their own aluminum foundries to make the billet used in the extrusion process. These companies typically use a high percentage of recycled aluminum in the foundry to make new billets. A very small amount of the aluminum becomes waste material.

Aluminum door frames and windows are factory painted or anodized under the strict guidelines of local, state and federal codes. Little or no pollutants enter the atmosphere, whereas painting in the field allows fumes to enter the atmosphere as a result of the drying process. Plus in the factory there is no danger of paint fumes affecting the air quality of other tenants.

Paint applied in the factory is cured during the painting process and its physical properties are set at that point. In addition, interior paint should meet the AAMA 603.8 performance specifications for pigmented organic coatings, something that is not the case in the field.

It's important to note that the curing process of air dry paint requires a significant amount of time and that even though the paint is dry to the touch, it may not necessarily be cured.

Anodizing, the other type of factory finishing, consists of applying a caustic etch followed by an anodic oxide treatment. A wide variety of colors are available, with the most commonly used being clear, dark bronze, and black. Clear anodized is consistent in its color. Bronze and black vary in shades by batch, a fact to be considered when a close color match is required.

INTERIOR APPLICATIONS

Curved and faceted walls are easily constructed with aluminum extrusions. An adjustable 24° vertical mullion is available to integrate the preassembled window units, which means that the curve or facets can be adjusted in the field.

Aluminum interior systems also include door framing for fire doors, pocket doors, biparting doors and bypassing doors, providing for a consistent interior appearance. Some aluminum doorframe manufacturers offer sliding doors that open to mirror sidelights. Doors can also be custom designed.

Aluminum as an interior officefront building material is also validated by its cost when compared to other building materials. Not only is aluminum comparable in material costs to other materials but, when labor costs for assembly, installation, and field painting are included, aluminum is often at a price advantage.



At First U.S.A. in Dallas, architect The Lauck Group used different paint finishes to bring variety to the aluminum frames (left and below).



At Nokia House (right) in Irving, Tex., aluminum frames and clear windows are integrated into a hall's partition system to create a traditional image. Designed by Good, Fulton and Farrell Architects. Gensler and Associates/Studio Architects achieve a more contemporary aesthetic at Apple Computers, Inc., Research and Development Campus (below) in Cupertino, Calif.





VERSATILE ALUMINUM WINDOW AND DOOR FRAMES

Learning Objectives:
After reading *Versatile Aluminum Window and Door Frames: Material of Choice for Interior Applications*, you should be able to:

- Describe how the use of aluminum aids construction time.
- Discuss why aluminum is considered a versatile building material.
- Explain how the use of aluminum is good for our environment.
- Identify the versatility of aluminum window and door frames in specific applications.

Instructions:
The preceding article *Versatile Aluminum Window and Door Frames: Material of Choice for Interior Applications*, provided by United States Aluminum is part of the AIA/Architectural Record Continuing Education Series. You can receive two continuing education learning units that quality for health, safety and welfare credits by reading the article, studying the learning objectives and answering the question below. Turn the page upside down to check your answers. Then fill out the self-report form (page 158) and submit it or use the Continuing Education self-report form on *Record's* website, www.architecturalrecord.com.

QUESTIONS

1. Why is aluminum considered a versatile building material?
Answer

2. How is the use of aluminum good for our environment?
Answer

3. How does aluminum become corrosion resistant?
Answer

4. What are the benefits of using aluminum in construction scheduling?
Answer

ANSWERS

1. Aluminum is versatile in both design and construction properties. For design, aluminum offers versatility in shapes such as curved and angled windows and walls, as well as intricately designed window or door profiles. It can be constructed so that screws do not show, and can be made for different thicknesses of glass. In construction properties it is versatile because of its easy assembly and it is not limited by time constraints. Aluminum windows or walls can be designed into a project in the beginning, or brought in after the walls and carpet are in place, or later as a retrofit.

2. Aluminum use is a good choice environmentally because it is not depleting a natural resource and its use is not harming the environment. Aluminum is the most abundant metal in the earth's crust and it is widely recycled. Most aluminum alloys contain recycled aluminum. A very small amount of the aluminum becomes waste material. Aluminum frames are usually painted or anodized in the factory under strict guidelines so that little or no pollutants enter the atmosphere.

3. Aluminum is corrosion resistant naturally when it is exposed to air. It forms a tightly bonded glasslike surface film that reforms if the surface is scratched. Other metal materials corrode easily when exposed to air and water, which is a drawback in construction.

4. In construction scheduling aluminum allows flexibility. It can be finished in the factory so it is not necessary to allow for field finishing and drying time in the schedule. Also, it can be easily installed by screwing two splines together, requiring little expertise by the assembler and the installer. It is lightweight and strong, making transporting aluminum frames easier than other materials.

For More Information Contact:

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LOCKING THEM UP *continued from page 71*

attorney at the Youth Law Center in San Francisco. "The only boot camps that have real success," says Chinn, "are ones with a very strong therapeutic focus and that tie people into services when they come out."

The juvenile justice system today is becoming the last resort for children who once were handled in other ways. "You are seeing more suspensions and expulsions from schools," explains Colorado's Adamek. "The schools become safer, but too many of these kids are on the streets with no structure and no supervision. Many of them end up in the juvenile justice system in short order," as do poor youths with mental-health problems, who often have no other options.

Gail Gargiulo, regional manager for Correctional Health Services, which serves 13 adult and juvenile facilities in New Jersey, estimates that 65 percent of the juvenile inmates she sees are either "mentally disabled or emotionally challenged." Most facilities are simply not equipped or funded to take on the variety or seriousness of the disabilities of these inmates, who, Adamek notes, range from the developmentally disabled (with low IQs) to abused, neglected, or abandoned kids, situations often complicated by drug use. One national study documented "suicidal behavior" in 11,000 detained youths annually.

Housing shoplifters and murderers—together

Even new facilities must deal with a wide range of detainee behaviors and needs, especially those that handle people who have been arrested but not yet convicted. The three-year-old Hudson County Detention Center in Secaucus, New Jersey, by architect Ricci Associates with Dean Marchetto Associates, is clean and well maintained. Its architectural niceties include high ceilings, clerestory windows in dayrooms, and windows in every bunkroom. Residents, dressed in orange uniforms, are permitted to walk in columns down the center of halls only and must be quiet while moving from place to place and pause silently when visitors pass.

You can't judge from the look of the average detainee, but he (or she) may be a sex offender, a violent offender, or disabled. Robert Murray, director of the facility, has six housing units into which he can sort, or "classify," the youths. The facility has held youths picked up for infractions as minor as shoplifting toys to those accused of murder. The housing units are smaller than those in adult facilities, which gives Murray greater control, but he has had to double-bunk most rooms, which exposes smaller or weaker detainees to a higher risk of assault and rape.

More youths are now being waived to adult systems, which don't want them because they become prey to older, stronger inmates. A number of states have begun to build specialized facilities that combine the higher security and more restrictive environment of adult prisons with the education, mentoring, and treatment programs associated with juvenile systems.

Though unprecedented levels of construction and operation dollars have flowed into juvenile corrections in recent years, most jurisdictions find there is a limit to what taxpayers will tolerate. This is giving a higher profile to advocates' calls for better-implemented alternatives to prison, which may divert more kids from crime at lower cost. Architects may have a role in developing emerging models such as what Frank Greene, AIA, of Ricci Associates calls "one family, one court," which tries to forge closer links among family, civil, and criminal courts in order to involve the justice system in trying to solve family issues that foster crime. As Adamek says, "There is no evidence that any jurisdiction has built themselves out of this problem." ■

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FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

Fiber optic lighting systems are extremely versatile, and theoretically can be used in place of any traditional lighting system. However, the industry is still in its infancy. Given today's level of technology, it makes sense to use fiber optic lighting systems only in certain applications. But don't blink for too long, because the technology is advancing rapidly and in a couple of years it will make sense to use fiber optics even for general lighting.

Fiber optic systems make sense today for application where you must remove heat or UV from the systems (such as in retail displays and in museums). Fiber optics make sense when the electricity in the system should be remote from the light (pools and spas, e.g.). Or when it makes sense to reduce maintenance costs of lighting systems when lamp replacement is a major hassle (some chandeliers). And fiber optic lighting systems make sense when you're trying to achieve special lighting effects based on a number of small points of light, rather than a single large source (signs, accent lighting, etc.).

Fiber optic lighting systems are simply still too inefficient for general lighting to reach uniformly high ambient levels (say, 50 footcandles). And since it's not currently possible to put enough lumens into an individual fiber to carry over long throw distances, fiber optic lighting systems don't make sense when the throw distance (from the output fixture to the object being illuminated) is greater than four or five feet. So, much general room lighting is a poor choice for fiber optic lighting—for now.

What are the basic tenets of fiber optic lighting? How does the technology work? What advantages can architects gain through using these systems?

The following, brought to you by Unison Fiber Optic Lighting Systems, will answer those questions and much more. And by studying the learning objectives, reading the article and answering the questions you can participate in an AIA/ARCHITECTURAL RECORD Continuing Education opportunity.





AIA / ARCHITECTURAL RECORD
Continuing Education Series

Use the learning objectives below to focus your study as you read **FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN**. To earn two health, safety, and welfare learning credits, answer the questions on page 156 and follow the reporting instructions.

Learning Objectives.

After reading **FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN**, you should be able to:

1. Describe the advantages of using fiber optic lighting systems, compared to other lighting types.
2. Identify the architectural applications of fiber optic lighting systems.
3. Describe the three principle components of fiber optic lighting systems.
4. Explain in simple terms how a fiber optics lighting system works.
5. Discuss the importance of efficiencies and luminance.

Unison™ is a joint venture of Advanced Lighting Technologies, makers of Venture Lighting metal halide lamps, and Rohm and Haas, makers of OptiFlex™ flexible light pipe. By combining these technologies, Unison offers a total solution for fiber optic lighting needs, including side and end light fiber, illuminators and fixtures, couplers, and even specially designed cutting and stripping tools.

Unison custom designs and manufactures complete fiber optic lighting systems. Unison's CableLite™ and FiberImages™ Divisions offer product design and application expertise for signs, panels, logos, curtains, and other products that require fiber optic systems.

FIBER OPTIC LIGHTING

In fiber optic lighting systems, a lamp transfers its light through to the end of the fiber or linearly through the fiber's transparent sheathing.

The most noteworthy advantage of using fiber optic lighting systems is that the light is separated from the electricity that generates light. And, too, one source can drive many fibers and produce multiple points or lines of light.

By separating light and electricity, fiber optic lighting can be used to light electrically or chemically hazardous areas, such as pools, spas, fountains, or in environmentally sensitive industrial situations. The reason: the light produces no electrical shocks and will not become a fire hazard. A sidelight fiber can be used in places where the potential of breakage or of contact with a high voltage transformer makes a neon light hazardous.

In addition, nearly all fiber optic lighting systems use both heat (infrared or IR) and ultraviolet (UV) filters at the

FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

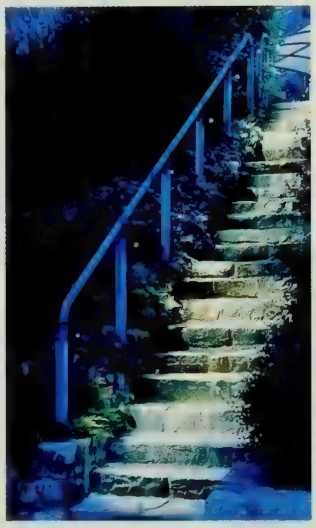
Applying Cutting-Edge Technology to Architectural Applications

light source. As a result, the output light contains no UV and no heat. This makes the systems especially desirable for lighting retail displays containing products that are sensitive to heat, as well as museum displays of temperature sensitive artifacts and art. Basically, dyes and oil paints won't fade, chocolate won't melt, and fresh flowers won't wilt.

The use of fiber optic lighting systems (FOLSs) can also lead to improved energy efficiency in some cases, particularly through the use of metal halide (MH) light sources. Because a single lamp can illuminate many fibers, maintenance costs can be reduced and maintenance tasks simplified, particularly for the hard-to-reach bulb. In addition there is economy of scale, as one bulb can light an entire chandelier or a ceiling or wall of sprinkle lights.







Overall, fiber optic lighting systems can be used in almost any lighting situation. The Lighting Research Center at Rensselaer Polytechnic Institute and others have tracked the following applications of fiber optic lighting:

- Displays and exhibits—fiber optics replace the traditional linear fluorescent and MR16 lighting in museum and retail displays.
- Water—fiber optics is used in at least 10 percent of the water lighting market and that market is growing.
- Architectural highlights—spots of light from end-emitting fibers can dramatically highlight the architectural features of a room or building. Side-emitting plastic fiber and prism light guides can outline the exterior contours of buildings.
- Signage and visual guidance—fiber optics systems are used to light a variety of signs and are also used in edge-lit exit signs, billboards, and traffic signals. Fiber optics light steps and aisles in theaters and, in turn provide a safer, more accessible environment. Signage projects are perhaps the most dramatic application, in that PMMA fibers can be assembled to create unique and vibrant images ranging from random patterns to intricate designs including logs and animated figures. White light or a variety of colors can be used to achieve versatile and exciting design. Fiber optic cables with larger diameters produce channel lettering, and perimeter, backlight and outline illumination.
- Decorative—chosen for special effects such as color changes and strobing, FOLS can produce a starlight effect for ceilings and can mimic flickering candlelight for historic ambiance.
- Downlight and ambient—although the Rensselaer Lighting Research Center found that fiber optic lighting systems are not widely used for downlighting and ambient light in the United States, in Europe such systems are popular for offices and restaurants.

ANATOMY OF AN FOLS

A fiber optic lighting system (FOLS) consists of three principle components—the illuminator, the fibers, and the output fixture. Note that for sidelight applications, the fiber doubles as the output fixture. The color of the emitted light can easily be changed through the use of a color wheel and the intensity lessened with a mechanical dimmer.

Illuminator. The illuminator consists of a lamp, ballast or transformer, and collection optics to channel the light into the fiber.

The **lamp** is most often either halogen or metal halide (MH). The most commonly used is a 150 W MH, although a variety of outputs are available.

The **ballast** or the **transformer** convert the input electricity to the current and voltage required to start and operate the lamp.

The **collection optics** channel the light into the fiber and are usually based on a glass or metal reflector, an UV filter, and if desired, color filters. The reflector captures the light emitted by the lamp and directs it into the fibers. Most illuminators employ a fan to dissipate the heat generated by the lamp, although Unison has recently introduced a fanless model.

Fibers. Optical fibers for illumination are either glass or plastic and at least two layers—an inner core surrounded by a thin cladding. There may be an additional third layer or sheathing for protection of the inner fiber. Bundling individual fibers together is a common practice, with this assembly referred to as bundled fiber. Nonbundled fibers are commonly called solid core fibers, or large diameter fibers.

The core and cladding must be of different materials for the system to function properly. Nearly all cladding layers are made of some kind of fluoroplymer (an example being Teflon FEP™). The core is either glass or plastic, with the plastic being either an acrylic or methacrylic copoloymer. The most common plastic core for bundled fiber is PMMA (poly methyl methacrylate), known by the trade name Plexiglas™. If present, the sheathing is PVC (vinyl) or polyethylene.

Glass fibers. Made thin enough to bend (.05 mm or .002 inch.), glass fibers are inherently brittle. And, because the glass fibers are so delicate, they are always bundled and always completely assembled at the factory. Generally, several glass bundles are gathered together into a "common end," which is attached to the illuminator (the complete assembly is called a harness). When you order a glass fiber harness, you must specify the number of tails, the length of each tail, and the diameters of the common end and of the tails.

Glass fibers are not damaged by heat or UV light like plastic fibers can be—an advantage for using glass. However, as mentioned above, unlike plastic, exact lengths must be specified and factory prefabricated rather than cut at site.

Bundled Plastic Fibers. Made of extruded PMMA, individual plastic fibers

commonly .030 inches to .060 inches, or about 20 times the size of glass fibers. The diameter of the individual fiber is determined by brittleness of the PMMA; if the fiber is larger than 1 mm, the fibers may not be bent to a reasonable radius without breaking. PMMA fibers are separated and used individually for such applications as signs, star ceilings, and fiber optic curtains.

PMMA fibers are considered very durable compared to other plastic fibers. The main disadvantage of PMMA fibers is packing fraction loss, in which light from the illuminator inevitably filters into the gap between the fibers, thus decreasing efficiency.

For endlights, the individual fibers



are bundled very loosely in an opaque sheathing. For sidelight, the individual fibers are tightly bundled and twisted around each other and then covered with a tightfitting clear sheathing. The tighter the twist, the more light escapes.

Solid Core Plastic Fibers. Typically ranging in diameter from 3mm (1/8 inch) to 12 mm (1/2 inch), most solid core plastic fibers are cast of copolymers of MMA (methyl methacrylate) and a cross-link/plasticizer to add strength and flexibility. Unison's OptiFlex is constructed of a different, inherently flexible acrylate and a cross-linker to provide more flexibility at room temperature. With either process, the cladding acts to contain the core until the core "cures." Therefore, for solid core fibers, the cladding layer is much thicker than the sprayed or dipped cladding layers on small diameter acrylic fibers.

Output fixtures. The first fixtures used for fiber optic lighting systems were simply standard lighting fixtures with the electrical guts ripped out. The industry has progressed and now offers fixtures designed specifically for fiber optics; yet, most output fixtures are still based on standard electrical lighting fixture designs.

Coupler. A coupler allows several large core fibers to be attached to a single illuminator. One coupling method is to split the light at the illuminator's main port into several small ports using segmented lenses. Each fiber is then inserted into one of the small ports. Another method is to gather the fibers together in a bundle over the last several inches of their length, which is actually a labor-intensive operation. A third alternative utilizes a short glass fiber harness as a coupler, with the common end joined to the illuminator and each tail joined to a separate fiber.

The coupler is commonly used to randomize both the color and intensity across the faces of the various light pipes attached to it. Intensity variations occur because of the projection of the MH arc—the source of the light—onto a circular port. The color variations result from the chemistry inside the lamps. Basically, different colors are emitted at different angles, especially as you move away from the center of the arc.

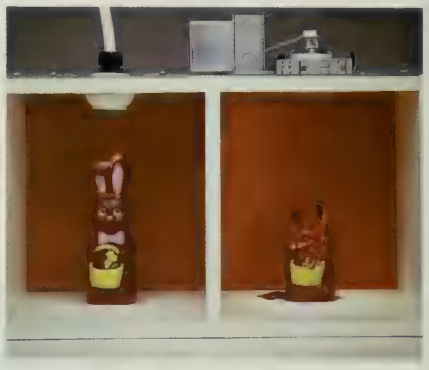
Randomization is easy to accomplish with a glass fiber harness—just mix up the individual strands of glass so that the strands that are going to any given tail go to several different areas of the common end. Another method is to use a glass mixing rod that averages out the angular effects.

HOW IT ALL WORKS

All optical fibers work on the principal of total internal reflection, or TIR. Whenever light traveling in one material approaches another material (such as the movement from the core to the cladding), the light is bent somewhat as it enters the second material. If the light approaches the second material at a shallow enough angle (known as the critical angle), then it is bent so much that it never enters the second material at all. It is totally reflected back into the first material—an amazingly efficient process.

For instance, a typical glass mirror may reflect only about 90 percent of the light that hits it. However, total internal reflection reflects essentially all of the light. This allows the light to travel far distances, undergoing many hundreds of bounces along the light pipe without being absorbed.

How shallow the light rays must be



in order to be totally reflected is determined by how different the core and cladding are. This is measured by the refractive index, which is essentially a measure of the speed of light in the material. The greater the difference between the indices of refraction, the more light (over steeper and steeper angles) will undergo TIR.

All optical fibers are characterized by an acceptance angle—the maximum angle (away from "straight on") at which light can enter the fiber and be totally internally reflected down its length. The acceptance angle is determined only by what the core and cladding are made of. For plastic optical fibers, the acceptance angle is usually about 35° to 40°. This means that all lighting hitting the face of the fiber in a cone of 70° to 80° (from +35° or +40° to -35° to -40°) will be internally reflected. The rest of the light is reflected back out the face or absorbed by the core, cladding, or sheathing.

Another measure of the ability of a fiber to gather light is the numerical aperture (NA). This is defined as the square root of the difference between



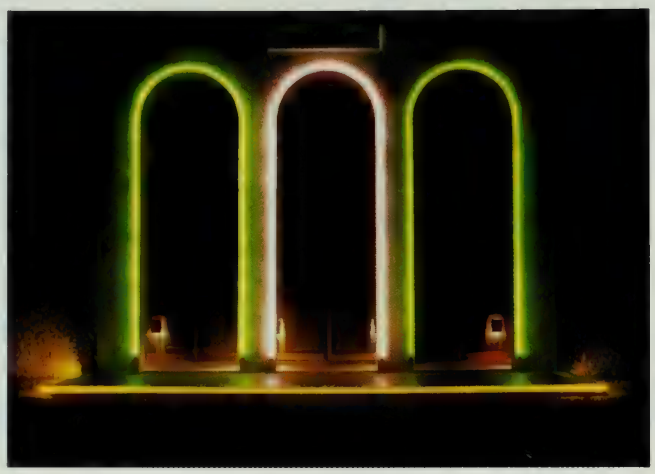
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the squares of the refractive indices: $NA = \sqrt{n^2_{core} - n^2_{clad}}$ where n is the index of refraction. The acceptance angle is simply the arcsine of the NA. The bigger the acceptance angle (or NA) the better, because the fiber collects more light.

Also note that if the fiber is bent, the angle at which light approaches the cladding from the core changes. For this reason, bending an optical fiber results in some light loss. Tests to measure loss under various bending conditions are not well-defined. In general, though, the more sweeping the bend, the less light is lost. The tighter the bend, the more light is lost.



OPERATING PROPERTIES

When specifying fiber optic lighting systems, the efficiencies, luminance, and color properties should be considered. Unfortunately, only a small amount of comparative data exists, although there is an effort among manufacturers to increase their analyses. In addition, output from any system depends on a number of factors not controlled by the manufacturer, such as the number and tightness of bends the fiber takes in the installation as well as the quality of the fiber end cuts. The quality of installation also affects the system's operation.

To aid in comparison and specification, the fiber optic industry is developing testing standards under the auspices of the National Electrical Manufacturers Association. Meanwhile, check with manufacturers for existing quantitative analyses. As with most lighting applications, a prototype or mock- up to determine system performance is suggested.

Efficiency. A typical fiber optic lighting system is about 15 percent efficient overall. In other words, of all the light generated by the lamp, only about 10 percent to 15 percent is emitted at the end source. Nearly all of the loss happens before the light is directed into the fiber. Fortunately, most FOLS use metal halide lamps, which are highly efficient, so overall efficiency can be higher than with incandescent lighting sources.

The most efficient system in the market is manufactured by Unison. The illuminator is based on a 68 W metal halide lamp that uses no fan. By getting rid of the fan and making the collection optics more efficient, the total system lumens of light per watt (lpw) of electricity used increases considerably and is similar to the efficiency of incandescent systems.

Within a year, Unison expects to introduce a system that will nearly double that efficiency—the system will be in the 25 to 30 lpw range—through a better coupling of the lamps' arc gap to the reflector (more efficient lamp-reflector combinations) and of the port to the fiber (a more efficient coupling mechanism).

Illuminance. To supply a particular quantity of light for a task, one measures illuminance. Illuminance is defined as flux density on a surface, expressed as lumens per square foot, or more typically known as a foot-candle.

Unless the system manufacturer specifies the total lumens emitted from the various output fixtures, the design should assume a MH lamp will produce 80 lpw. Thus, for a 250 W MH system, the designer should have no more than 15 percent of (80x250) or 3,000 total lumens at the fiber ends. (Remember, that's 3,000 total divided by the number of fibers, not just 3,000 for each fiber.) This also assumes a 10-foot-fiber runs with gentle bends only, excellent quality cuts, good connections, clean optics, fresh lamp, etc. Some manufacturers specify lumens available at the port. In that case, the designer should assume about 60 percent of those lumens can be delivered through 10 feet of fiber and the output fixture into the area to be lit.

It's important to note that output characteristics of the system change depending on the installation details—fiber length, number of bends, and the length of the run relative to the number and radius of the bends.

Color. All optical fibers change the color a bit as the light travels through them. Look at the color of light transmitted through 40 feet or more of fiber. Assuming that you start with white light, absorbing red will make the light appear greenish. Absorbing blue will make the light appear yellowish.

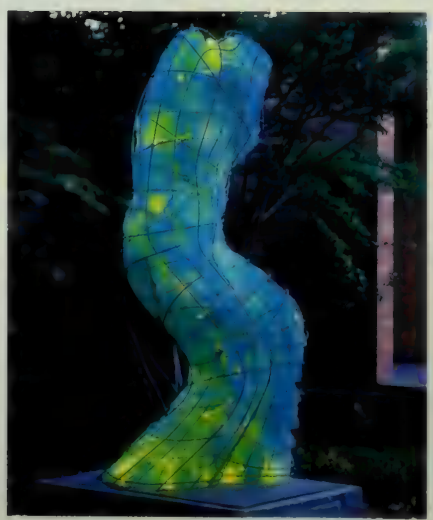
All types of plastic optical fibers absorb some red light. The absorption of blue differs, however, and is not fundamental to plastic fibers. This results from broad absorption bands in the UV that "tail" into the visible region. These UV absorptions are generally caused by "stuff" in the fiber left over from the polymerization. So, the cleaner the manufacturing process, the less blue is absorbed. Therefore, a greenish cast to the transmitted light implies a cleaner fiber and lower overall attenuation.

THE FUTURE OF FOLS

By all accounts the future for fiber optics lighting seems bright. Look for:

- Higher efficiency.
- Move toward fiber optics for more general room lighting, as seen in Europe.
- Systems cost decrease.
- Greater illuminance.

It's also important to note that manufacturers of fiber optic lighting systems are working to bring a standardization to the industry, which translates into more consumer confidence in a product and more information available to the consumer.



FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

Learning Objectives.

After reading FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN, you should be able to:

1. Describe the advantages of using fiber optic lighting systems, compared to other lighting types.
2. Identify the architectural applications of fiber optic lighting systems.
3. Describe the three principle components of fiber optic lighting systems.
4. Explain in simple terms how a fiber optics lighting system works.
5. Discuss the importance of efficiencies, luminance and color properties.

Instructions

Refer to the learning objectives at left.
Complete the questions below. Then turn the page upside down and check your answers.

Fill out the self-report form (page 158) and submit it or use the Continuing Education self-report form on *Record's* website, (www.architecturalrecord.com) to receive two health, safety, and welfare AIA Continuing Education units.

QUESTIONS

1. When it is advantageous to use fiber optic lighting systems?
Answer

2. When it is not yet advantageous to use fiber optic lighting systems?
Answer

3. What are some specific architectural applications of fiber optic lighting systems?
Answer

4. Describe the three principle components of fiber optic lighting systems—and how they work.
Answer

5. In simple terms, how does a fiber optics lighting system work?
Answer

6. When specifying a fiber optic lighting system what is the significant of efficiencies and luminance?
Answer

ANSWERS

1. Fiber optic lighting systems (FOLS) make sense when heat or UV is not desired. Fiber optics also makes sense to light electrically or chemically hazardous areas or other places where the electricity should be remote from the light source. FOLS can reduce maintenance costs where lamp replacement is hard-to-reach. And FOLS are desirable when you're trying to achieve special lighting effects based on a number of small points of light.

2. FOLS are still considered too inefficient for general lighting to achieve uniformly high ambient levels.

3. The most common applications of FOLS are for displays and exhibits, to provide light in water, architectural highlights, signage and visual guidance, and decorative lighting.

4. FOLS consists of three components. The illuminator consists of a lamp, ballast or transformer, and collection optics to channel the light into the fiber. Fibers are made of glass or plastic. Single fibers with larger single diameters are used as core fibers. Bundling individual fibers is a common practice. For sidelight applications, the fiber doubles as the output fixture. Most output fixtures used today are based on tradition lighting systems design. In addition, a coupler allows several large core fibers to be attached to a single illuminator.

5. All fiber optics work on the principal of total internal reflection. When a light traveling in one material approaches another, it is bent somewhat. If the light approaches the second material at a shallow enough angle, then it does not enter the second material but is reflected back into the first.

6. A typical fiber optic lighting system is about 15 percent efficient overall, but that level will increase in the near future. To supply a particular quantity of light for a task, one measures illuminance, which is defined as flux density on a surface or lumens. The designer should assume a metal halide light will provide 80 lumens per watt.

For more information, contact:

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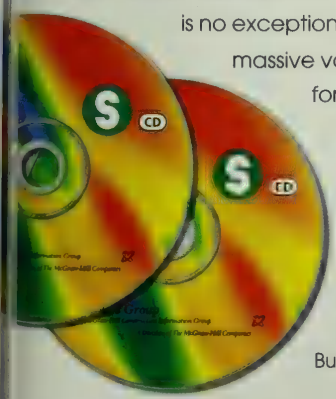
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ANSWERS

Questions appear on page 136. To receive CES credits, fill in the education reporting form below or on our Web site (www.archrecord.com).

1. The two factors in establishing a commercial building's cooling load are the design load and the actual operating load. The design load is based on the design of the building, how many people are expected to be in it, weather data, and solar radiation figures. This information is calculated to come up with a cooling system sized to reject heat gain on the hottest day of the year. Then a safety factor of 20 to 100 percent is added. The actual operating load is usually much less than the design load, since all of the projected figures are maximums that rarely occur at the same time.

2. The heating load is the amount of heat input needed to keep a building warm inside. Heating equipment takes up less space and costs less to buy and install than cooling equipment. The cooling load is the rate of heat rejection required to keep a building cool inside. Cooling loads include solar radiation, heat gain through the building skin, hot outside air brought in through the ventilation system, lights, people, and plug loads. Commercial buildings normally need more cooling than heating because they are often blocky, which means internal areas with no outside exposure have no cool windows in the wintertime to which they lose heat.

3. Energy modeling is a computer-generated projection of where energy will be used within or lost from a building. Software programs re-create airflow and other dynamics within the building and give an accurate picture of where the heating and cooling energy will go. Modeling is especially useful when real figures can be used, as in the case of a building that is being retrofitted.

4. Thermal loads can be reduced with careful design and by working with the mechanical engineer. Most of a building's solar load is introduced through its glazing. Placing glass on the east and north walls, rather than the south and west, reduces solar heat gain. Glass that's tinted or has a low-e or spectrally selective coating has the best solar heat gain coefficient. Shading devices and deeply recessed windows also keep heat outside. Another factor in solar heat gain is roofing color. A light-colored roof saves 15 to 20 percent of total cooling energy. Electrical heat loads normally come from lighting and power outlets. New lighting systems that use compact fluorescent lamps and smart controls generate less heat than incandescents that are left on all day. Plug-in devices, such as copiers, computers, and printers, are a large part of the workplace thermal load. New devices use less energy and put out less heat than older models. Thermal mass, such as thick concrete or masonry slabs, can be used to buffer peak cooling loads and take advantage of cool nighttime temperatures. Insulation improves winter heating loads in cold climates where the temperature differential between inside and outside air is often more than 60 degrees.

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The Presidential Design Awards program is administered by the U.S. General Services Administration and the National Endowment for the Arts.

(continued from page 52)

James Beard Foundation/Interior Design Magazine Awards
Submission deadline: January 29
Established in 1995 to honor excellence in interior and graphic design for restaurants, these awards are given for projects in the United States and Canada. For more information, write the James Beard Foundation, 6 West 18th Street, 10th floor, New York, N.Y. 10011 or visit www.jamesbeard.org.

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Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. For registration information call Liu Kecheng at Xi'an University, Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn.

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DuPont Benedictus Awards
Submission deadline: March 8 (professional architects); March 19 (students)
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Please submit information for events and competitions at least six weeks prior to the magazine's publication date (January 15 for the March issue).



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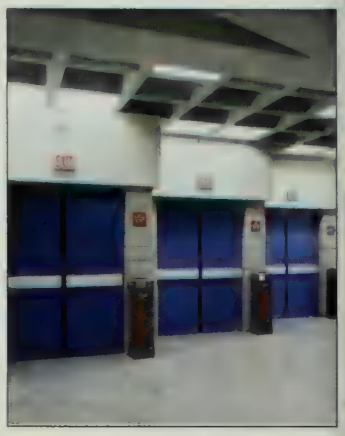


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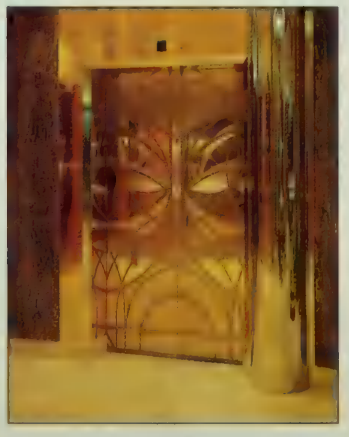


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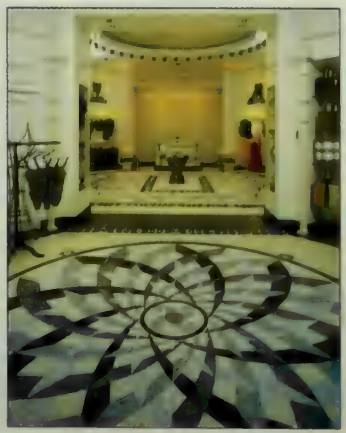


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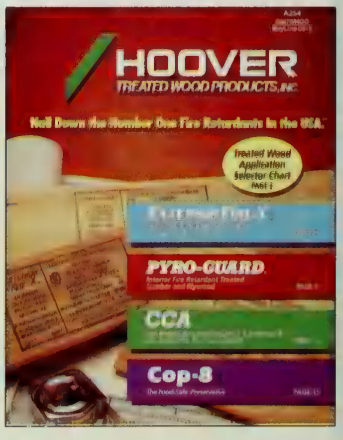


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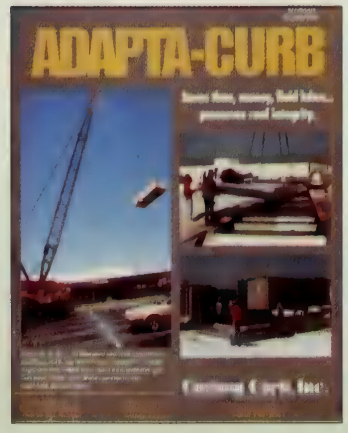


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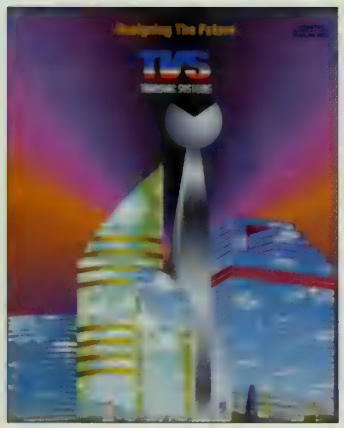
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Feature adjustable height, width, tilt & swivel. Mounting plate allows the fine-tuning of gravity in relation to degree of tilt, while top clamps provide stability. Constructed of heavy gauge steel with durable epoxy finish, mounts are avail. in sizes to accom. 13" - 42" screens & 125lb. - 300lb. UL listed & CSA cert. Several OSHPD apprd. VCR attachments & tamper resistant security fasteners opt.



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GRESSCO Ltd.

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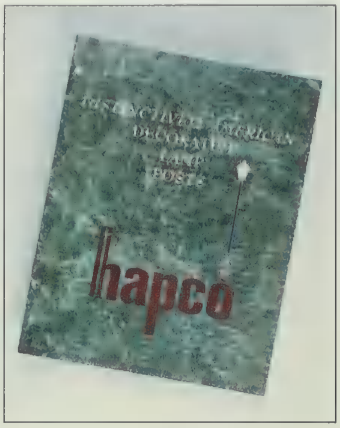
Springs Window Fashions

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HAPCO

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The Garland Company, Inc.

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B-K LIGHTING is proud to announce the completion of their new catalog. This catalog features over 100 specification-grade, outdoor, architectural lighting fixtures. Included in the 106 page, four-color catalog is CAD information, lamp data, photometrics & much, much more. To receive one of the most informative, detailed & 'engineering friendly' catalogs in the lighting industry, contact B-K LIGHTING today! B-K LIGHTING, 7595 N. Del Mar Avenue, Fresno, CA 93711. Phone: 209-438-5800 Fax: 209-438-5900. e-mail: bk@attitude.com www: light-link.com



B-K LIGHTING, INC.

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Fin Color Ply is a presurfaced multi-purpose plywood used for interior panels, furniture & cabinetry. Constructed with all Finland birch hardwood veneers, presurfaced on both sides with a durable colored translucent finish allowing visibility of the natural wood grain. Available in clear transparent, yellow, light brown, red, green, dark brown & opaque black. Panel size: 96" x 48"; Thicknesses: 1/2" (9-Ply) & 3/4" (14-Ply). Tel (310) 396-9991 Fax (310) 396-4482.



Finland Color Plywood Corp.

CIRCLE 130 ON INQUIRY CARD

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"ellen's brackets", and anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212/989-4959 Fax: 212/989-4977.



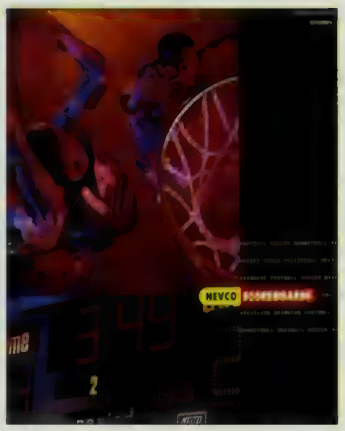
Parallel Design

CIRCLE 131 ON INQUIRY CARD

T: (800) 544-7929 F: (212) 904-2074

Scoreboards For Sports - Nevco Scoreboard Company

Nevco Scoreboard Company manufactures scoreboards for the following sports: basketball, baseball, football, soccer, wrestling, volleyball, swimming, track, hockey and in-line hockey. Our indoor scoreboards are available in incandescent and LED (light emitting diodes). Nevco scoreboards carry a 5 year guarantee and are UL Listed/CSA Certified. Call 800-851-4040 for information and a free color catalog.

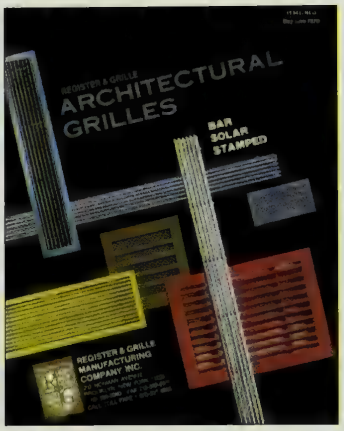


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Register & Grille Mfg., Co

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Eliason Easy Swing Double Action Doors

Available from Eliason is a new 1999 Easy Swing door Price/Spec catalog. Doors are illustrated in full color with complete specifications, prices and application data. Doors are gravity operated, open to a light assist and close automatically with a safe, gentle time delay action. Many sizes, styles and decor options. Doors are sold direct. Catalog is no charge. Eliason Corporation, PO Box 2128, Kalamazoo, MI 49003. Web: www.eliasoncorp.com T: 800-828-3655 F: 800-828-3577



Eliason Corporation

CIRCLE 134 ON INQUIRY CARD

Wood Construction Connectors Catalog

Strong-Tie's '99 catalog, Wood Construction Connectors, introduces fifteen new products. A necessary reference for structural engineers, building officials. and architects, the catalog includes updated specifications, load charts, application drawings, and building code acceptance -- plus information on holdown anchorage design, and available custom hangers. ISO9001 registered. For a copy of the 1999 catalog (C-99), write Simpson Strong-Tie Company, PO Box 10789, Pleasanton, CA 94588.



Simpson Strong-Tie Company

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The JOMY Safety Ladder Co. proudly introduces the Mini-JOMY, a scaled down version of the JOMY Safety Ladder, specially designed for residential & light commercial applications. The Mini-JOMY looks like a drainpipe but folds out to a 17" wide ladder with slip resistant rungs constructed of extruded anodized aluminum & stainless steel. The Mini-JOMY is maintenance free & will last the lifetime of any building. Call 800-255-2591 for additional information.



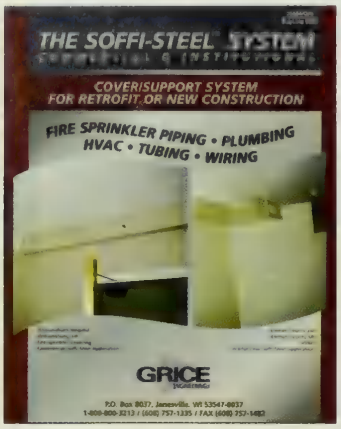
JOMY Safety Ladder Co.

CIRCLE 137 ON INQUIRY CARD

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Grice Engineering, Inc.

CIRCLE 138 ON INQUIRY CARD

Catalog of Roofing Publications & Audiovisuals

The National Roofing Contractors Association has more than 90 roofing-related products, including the 1,858-page NRCA Roofing and Water-proofing Manual-Fourth Edition and the NRCA Construction Details on CD-ROM in .DWG and .DFX formats. For a free catalog, contact NRCA Marketing Services. 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018, (800) 323-9545.



National Roofing

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Hanover Lantern designs & manufactures high quality heavy duty cast titanium/aluminum commercial grade decorative lighting fixtures, poles & accessories. A selection of design styles, light source options, light distribution systems, mounting options, computer generated photometric data plus a custom design service are available to the architect or engineer. 350 Kindig Lane, Hanover PA 17331. T: (717) 632-6464 F: (717) 632-5039



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We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.



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Waupaca Elevator

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The Insulated Drainage Board

ThermaDrain® eliminates the need for a clean airspace. Currently, a 2" airspace is the primary means of providing sufficient drainage for cavity walls. However, poor workmanship, mortar blockages and mortar bridging can and does occur in airspaces 2" or greater. This allows water to bridge the cavity before it ever reaches the flashing and weepholes. ThermaDrain® eliminates workmanship problems and provides a continuous drainage path to the required flashing. Call us for a data sheet and a free sample.(800-837-4065) *Patent Pending

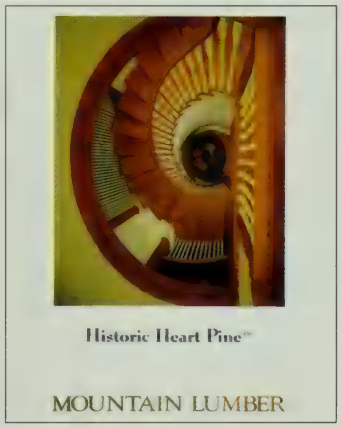


ThermaDrain* ®

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Wood for Flooring and Architectural Accents

Mountain Lumber: celebrating 25 years of sustainability, reclaiming antique wood for flooring and architectural accents. Product lines include seven grades of Historic Heart Pine®, plus Antique American Oak and Chestnut and Antique Russian Oak. Styles range from formal to rustic, to suit any design project. Free brochure. 1-800-445-2671 or www.mountainlumber.com



Mountain Lumber

CIRCLE 146 ON INQUIRY CARD

FRT Wood & Building Codes

"Reference Guide for designing with fire retardant treated wood" outlines codes-compliant applications for FRT wood. This includes the National, Standard, Uniform, and CABO codes. The recently updated guide also covers design properties, test standards, identification, and specification, and describes the Dricon® brand. Hickson Corp., 1955 Lake Park Dr., Suite 250, Smyrna, GA 30080. Tel: 770-801-6600. Web site: www.dricon.com

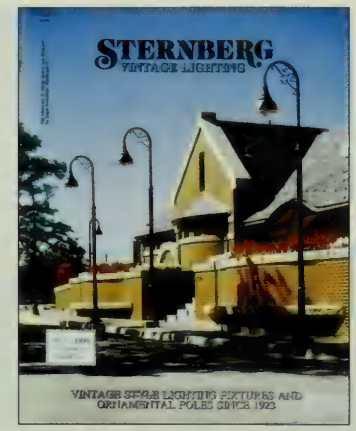


Hickson Corp.

CIRCLE 147 ON INQUIRY CARD

A New 1998 Catalog From Sternberg Vintage Lighting

This 80-page full color catalog is packed with about 500 individual product photos and shots of installations of all types. There are new fixtures, ornamental poles, new bollards, a new fitter and more information to help specifiers choose the right product and options for a specific project. Sternberg celebrates their 75th anniversary in 1998. It is an employee owned company with all products manufactured in their Niles IL plant.

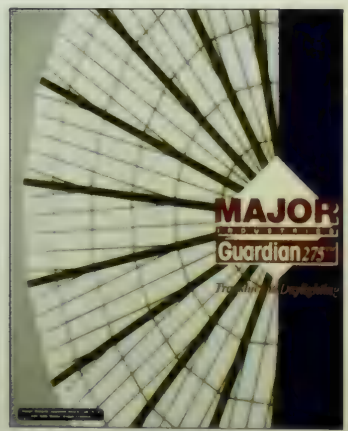


Sternberg Vintage Lighting

CIRCLE 148 ON INQUIRY CARD

Skylights & Translucent Daylighting

Major Industries introduces its newest catalog on translucent daylighting, covering the full range of translucent fiberglass insulated sandwich panel systems. Stunning photography illustrates classic and contemporary applications. If your interest involves skylights or translucent wall assemblies, keep abreast of developments in daylighting. Request a catalog by fax (715) 848-3336 or toll free at (888) SkyCost.



Major Industries

CIRCLE 149 ON INQUIRY CARD

TO ADVERTISE: Call Ally Klarin
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The Opening Glass Wall

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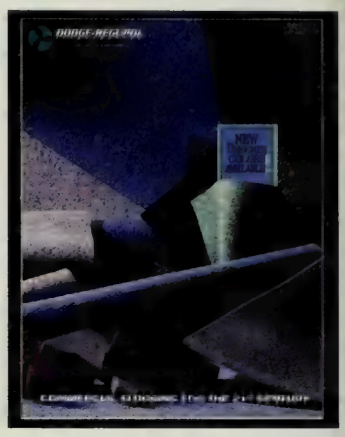


Nana Wall Systems, Inc.

CIRCLE 150 ON INQUIRY CARD

Rubber Flooring for the 21st Century

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Dodge Regupol

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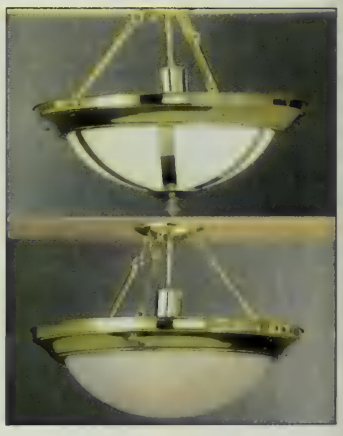


Accuride

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Good look alabaster done in ACRYLIC. White, Faux Alabaster, Faux beige Alabaster. Sizes from 10" to 96" in diameter. Incandescent or P.L. Metal finishes in Chrome, P.B. Brushed Steel, other finishes available. Matching wall brackets. For additional information request #17. Primelite Manufacturing, 407 South Main Street, Freeport, NY 11520. Phone: 516-868-4411 or Fax: 516-868-4609.



Primelight Manufacturing

CIRCLE 153 ON INQUIRY CARD

Introducing Nystrom Expansion Joint Covers!

Nystrom is pleased to announce the addition of expansion joint covers to our product line. Our new design catalog and binder is an ideal desktop reference for specification information on access panels, louvers, floor hatches, roof hatches, smoke vents and expansion joint covers. For additional information contact Nystrom directly at 1-800-547-2635 or check us out at WWW.NYSTROM.COM.



Nystrom

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Peter Pepper Products, Inc.

The Artform™ Collection offers fine German craftsmanship, engineering and innovative design. These elegantly shaped coat racks, hat shelves, hangers and matching wall tables provide a place for hanging garments in any interior. All pieces are impeccably finished using stainless steel, chrome, aluminum, glass and wood. Fax: 310.639.6013 Phone: 310.639.0390 www.peterpepper-products.com



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Flexible PM Exterior Insulation & Finish System

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Parex

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Acorn Engineering Company

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Exclusively Aluminum

Compiled to assist the architectural professional, the new and exciting 150 page GA Handbook covers the whole aluminum specification process, from design to on-site supply. Our extensive and unique range of perforated and patterned aluminum panels and accessory trims provide outstanding design solutions. Details are also included for the GA self-select samples service. For your free GA Handbook fax 011 44 181 694 2004.



Gooding Aluminum

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Independent Inc.

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CavClear® products are air space maintenance systems that provide a continuous drainage area by preventing mortar obstructions in air space. Ensures water management and improves long-term performance. Prevents mortar from making contact with back-up wythe or insulation, allowing moisture to migrate freely to unobstructed weeps. Call toll-free (888) 436-2620.

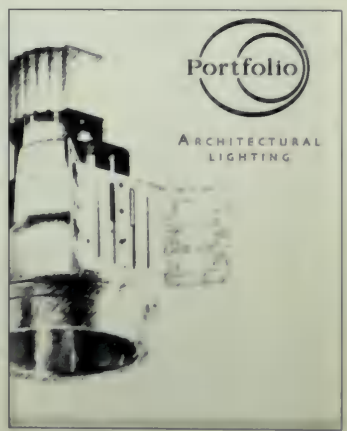


CavClear/Archovations

CIRCLE 160 ON INQUIRY CARD

Cooper Lighting Expands Portfolio

Cooper Lighting's Portfolio brand of architectural-grade recessed downlights has expanded to include over 130 luminaries accepting compact fluorescent, incandescent and H.i.D. lamp sources. Portfolio downlights feature matching apertures for consistent visual appearance, and equal cutoff to lamp and lamp image for glare-free illumination in all optical distributions.



Cooper Lighting

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Research and development has allowed Worthington Group to fill builders' needs with leading products in each category. Products are statically chosen for endurance, precision, ease of installation and price. Columns, Balustrading, Mantels, Moulding, Turnposts, Pediments, Medallions and more. Call for our catalog. Job site delivery and technical support a phone call away. Call 1-800-872-1608.

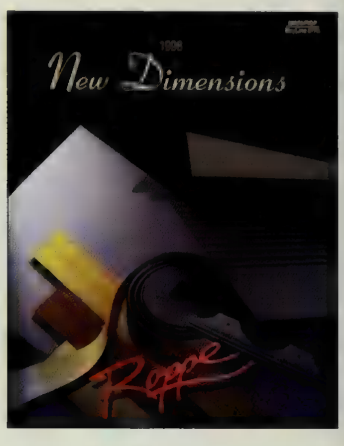


Worthington Group

CIRCLE 162 ON INQUIRY CARD

1998 Catalog

Roppe enters 1998 with more colors & styles of high quality flooring products. The North Coast Collection luxury vinyl tile line features Wood & Terra Naturals. Wood Naturals feature wood-look planks & tiles in many colors & styles. Terra Naturals contain a variety of marble, granite, & stone looks. Our expanded line of stair treads, including abrasive strip treads, meet current access code requirements. Offering more cove base varieties with a broad color selection. Products focus on quality & ease of installation & maintenance.



Roppe

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A powerful new idea in accent lighting

ProSpec® Linear combines the versatility of track with the unobtrusiveness of a recessed downlight. Featuring a range of 2, 3 and 4-lamp configurations in line voltage, low voltage and metal halide sources, the compact dimensions of ProSpec Linear allow a significantly cleaner installation while permitting larger focal pools to be created. (800) 215-1068.



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EverGreenBrochure

New Revere EverGreen™ prepatinated architectural copper lets you specify the rich, warm look of patina, without waiting decades to fulfill your vision. Completely matures after 4 to 6 rainfalls. Adds striking beauty & character to any roof or accent. New EverGreen brochure. Revere Copper Products, Inc. P.O. Box 300, Rome, NY 13442-0300, 800/950-1776; F: 315/338-2105; http://www.reverecopper.com



Revere Copper, Inc.

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Decorative, Thin-Film Intumescent Fireproofing

Improved spray characteristics and ratings up to 3 hours! A/D FIREFILM®II permits designers to use the appearance of exposed steel with the steel protected from fire. The product is applied as a thin-film coating 0.4 to 3.3 mm (16 to 130 mils) thick. When exposed to fire it expands to form a meringue-like insulating layer up to 4 in. thick. A/D COLORCOAT topcoat is available in a wide range of colours. Call 1-800-263-4087 or 416-263-4087. Internet: www.adfire.com



A/D Fire Protection

CIRCLE 166 ON INQUIRY CARD

Ancor Granite Tile

Ancor produces over fifty No. American and Imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas. 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada. Ph# (514) 385-9366, Fax# (514) 382-3533.



Ancor Granite

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SMART Technologies Inc.

CIRCLE 170 ON INQUIRY CARD

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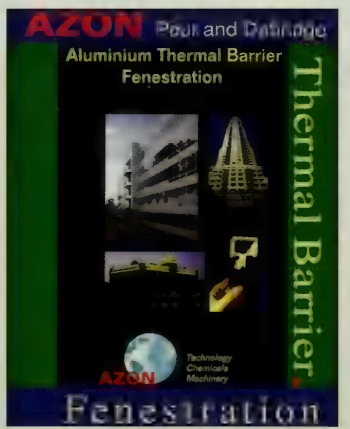


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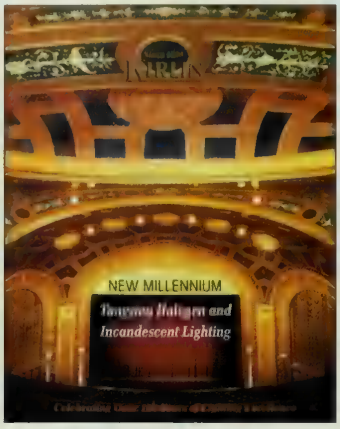


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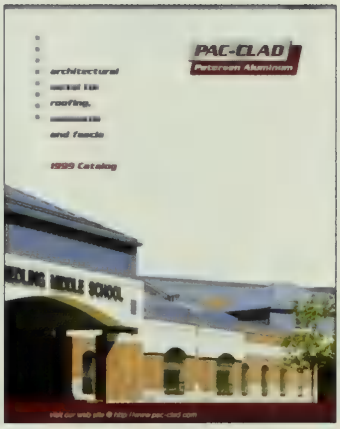


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Award winning Albany, NY, architectural firm with national practice specializing in historic restoration seeks experienced architect with 4-8 years experience. Proficient in historic building methods and materials, construction documents, building codes, preservation standards, construction administration, and AutoCAD R14. Good writing and verbal skills. Architectural license a plus but not required. Competitive salary commensurate with experience. EOE. Fax resume to John G. Waite Assoc. Architects, at 518-449-5828.

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Wanted by Construction Firm in Englewood Cliffs, NJ. Must have 2 yrs exp preparing detailed drawings of architectural dsgns/plans for bldgs & interiors for Japanese clients using AutoCAD & Micro Station SE. Respond to: H. R. Dept, KAI, 900 Sylvan Ave, Englewood Cliffs, NJ 07632.

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FACULTY POSITIONS VACANT

DEAN, SCHOOL OF ARCHITECTURE UNIVERSITY OF VIRGINIA

Applications and nominations are invited for the position of Dean of School of Architecture at the University of Virginia. The appointment will be effective on or before July 1, 1999. The four departments of the School of Architecture offer graduate and undergraduate degrees in architecture, architectural history, urban and environmental planning and graduate degrees in landscape architecture. In addition to these major fields, students may enroll in dual degree programs and interdisciplinary certificate programs in historic preservation and American urbanism. Approximately 560 students are currently enrolled in all departments. The fifty full-time and twenty-four part time members of the faculty reflect the commitment of the university to the highest levels of teaching and scholarship. Candidates should possess a record of excellence in scholarship or professional practice and credentials sufficient to qualify for appointment as a tenured professor in one of the departments in the School of Architecture; experience in leadership in an academic setting or comparable environment; a commitment to promoting gender, racial and ethnic equity; a capacity and willingness to support and represent the diverse disciplines within the School; and an understanding of and capability for resource development. Compensation is competitive and commensurate with qualifications and experience. Applications and nominations must be received by January 1, 1999 to ensure consideration and the review process will continue until the position is filled. The University of Virginia is an Affirmative Action/Equal Opportunity Employer. Submit applications and/or nominations, with a letter of interest, resume and references, to: William H. Sherman, Chair, Dean Search Committee, c/o Office of the Vice President and Provost, University of Virginia, P.O. Box 9014, Charlottesville, Virginia 22906-9014.

FACULTY POSITIONS VACANT

BALL STATE UNIVERSITY

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ASSISTANT PROF - TENURE TRACK UNIVERSITY OF WASHINGTON/ARCH. PLUS URBAN DESIGN

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ASSISTANT/ASSOCIATE PROFESSOR IN ARCHITECTURAL STUDIES

The College of Applied Sciences and Arts (ASA), Southern Illinois University, Carbondale is seeking qualified applicants for two anticipated faculty positions in Architectural Studies beginning August 15, 1999, or until acceptable applicants are found. Both positions are nine-month, continuing appointments and may lead to tenure. Rank and salary will be commensurate with experience. This is an excellent opportunity to contribute to a new pre-professional program of architecture. Required Qualifications: Earned Master's degree in Architecture or equivalent Master's degree; licensed or eligible to take the ARE in the state of Illinois; demonstrated ability in all phases of architectural practice; teaching experience. Preferred Qualifications: Earned Doctorate; licensed Architect; established research and publication record; demonstrated theoretical, creative design, and graphic presentation abilities; proficiency in computer technologies. Responsibilities: Both faculty members will be expected to teach lecture and studio courses across the curriculum. One position will be required to teach mechanical systems; to engage in research, creative, and scholarly activities; to make professional contributions to the University and the discipline at large; to participate in program support activities as well as other assignments as determined. Application Deadline: January 8, 1999, or until suitable applicant is found. To Apply: Send a letter of interest and goals, current vitae, a minimum of 10 varied photocopy samples of professional work (not to be returned), and names, addresses, and phone numbers of three references to: Mr. Terry A. Owens, Chair, Department of Applied Arts, Southern Illinois University, Carbondale, IL 62901-4337. SIUC is an AA/EOE.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN SCHOOL OF ARCHITECTURE

The School of Architecture is seeking applications and nominations for four full-time, nine-month teaching positions to begin August 21, 1999. The School of Architecture is comprised of four teaching divisions (Design, Architectural Structures, Practice and Technology and History and Preservation) and a research division (Building Research Council). Individuals who can integrate knowledge from their specialty into design studios will be given highest priority.

The salary for these positions will be determined by qualifications and experience. Candidates must be highly motivated and dedicated individuals who can take advantage of the University of Illinois' resources which include one of the country's largest and finest university library systems and access to associated research programs and computer facilities. A Ph.D. program is in the final stage of development. All teaching positions will have other responsibilities to include research/creativity, committee assignments, and public service.

Although each position indicates specific qualifications, this does not preclude candidates with exceptional research, teaching, or scholarship qualifications from applying.

REQUIRED SUBMISSIONS: Please send a Letter of Application which should state clearly which of the positions you are seeking, a complete Curriculum Vitae, a brief Statement of Educational and Research Objectives and the Names of three (3) referees. Short-listed candidates will be asked for examples of work.

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QUALIFICATIONS: Candidates must have 1) a MArch, MSAE or MSCE degree and license to practice architecture or structural engineering; or a Ph.D with research experience related to building structures, and 2) the ability to teach undergraduate and graduate courses in the Structures Division and to participate in architectural design studio reviews.

POSITION 2 AND 3: PRACTICE & TECHNOLOGY DIVISION
Two tenure track positions at the Assistant Professor level.

RESPONSIBILITIES: Teaching responsibilities of the division include graduate and undergraduate courses and conducting research in their respective fields. Candidates for each position must show evidence of academic and professional and or research achievement in at least two of the following areas: 1) Building Materials and Constructions Technology; 2) Building Thermal Physics and Mechanical Systems; 3) Comprehensive Building Design with Design Integration; and 4) Architectural Practice and Management.

QUALIFICATIONS: Candidates must have 1) a MArch and professional registration or 2) a Ph.D in architecture, engineering, or related field with direct relevance for the position. Professional and teaching experiences are desirable and candidates should have the ability to participate in architectural design studio reviews.

POSITION 4: DESIGN DIVISION, COMPUTER APPLICATIONS
One tenure track or tenured position at the Assistant or Associate Professor level.

RESPONSIBILITIES: Teaching responsibilities include one design studio course each semester, a lecture/seminar course, and participation in design reviews. Ability to teach courses in technology or architectural theory is also desirable. Candidates must be able to demonstrate significant experience using computer applications in architectural design. Candidates are expected to be able to demonstrate their potential to be leaders in the field of computer-based design applications. Candidates must have knowledge of a wide range of computer graphics and three dimensional modeling software and operating platforms including Macintosh, PC, and Unix environments. Individuals who are able to 1) integrate computers into design studio learning, and 2) integrate design issues with building technology will be given highest priority.

QUALIFICATIONS: Candidates must have 1) a MArch and professional registration or 2) a Ph.D in architecture. Professional experience and teaching experience is required.

To receive full consideration applications must be received by **January 15, 1999.** Direct submissions and inquiries to:

R. Alan Forrester, Director
School of Architecture
(Identify which Position number and Search by name here)
University of Illinois at Urbana-Champaign
611 Taft Drive
Champaign, IL 61820-6921 USA
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The HAU unit conducts the Department's BS, MA, and Ph.D programs in architectural and urban history, and is a vital component in its professional B.Arch. and M.Arch. design programs. We seek a scholar of distinction or high promise with the ability to relate historical research to contemporary contexts and design issues. Applicants should have a Ph.D., scholarly publications, and teaching experience. Responsibilities will include teaching at undergraduate and graduate levels, research, and administration. Rank and salary will be commensurate with experience.

Application review begins January 15, 1999; the appointment begins Fall 1999. Submit a letter of application, a curriculum vitae, names of three references, and a brief statement outlining teaching and scholarship objectives to: Professor Mary Woods, Chair, HAU Search Committee, Department of Architecture, 143 East Sibley Hall, Cornell University, Ithaca, NY 14853-6701.

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The Graduate School of Architecture, Planning, and Preservation is seeking candidates for two or three positions in its architecture programs (rank open). Responsibilities will include teaching, scholarship, and administration, including possibly serving as Director of the Advanced Architecture Studios. Professional and/or teaching experience is required. The emphasis will be on Architectural Design and/or Urban Design, with the ability to teach a seminar/lecture on Architectural History/Theory or Building Technologies. Candidates must hold a Master of Architecture or the equivalent. Applicants should respond with a letter of interest, curriculum vitae, illustrations or work or a writing sample not exceeding 35 pages, and names and addresses of three references. Review of applications will begin on January 18, 1999. Material should be sent to: Bernard Tschumi, Dean, Graduate School of Architecture, Planning, and Preservation, Columbia University, 402 Avery Hall, 1172 Amsterdam Avenue, New York, NY 10027. Columbia University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

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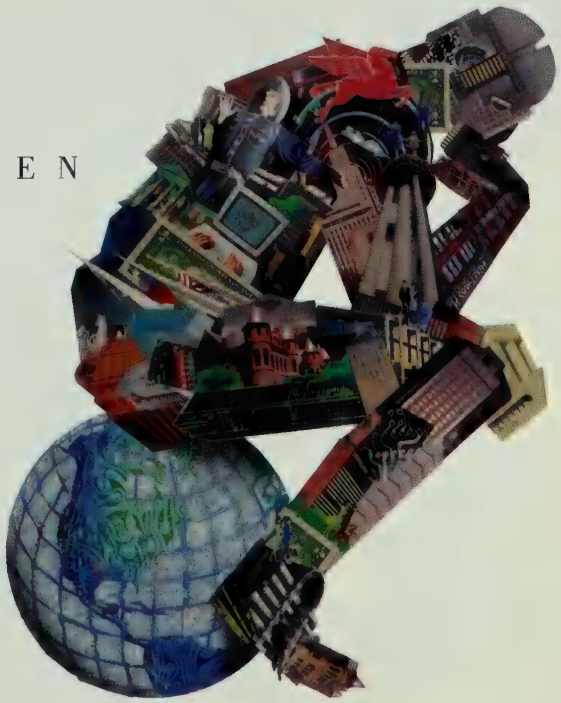
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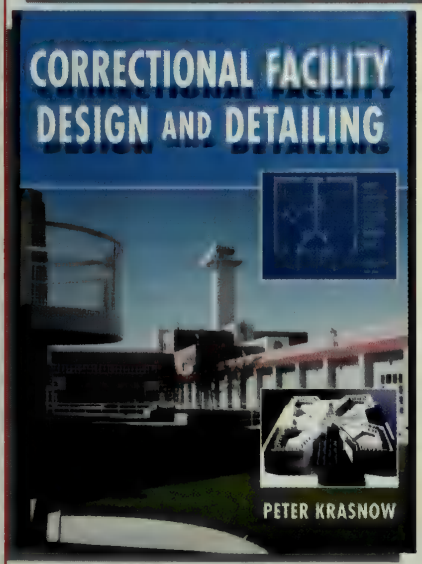
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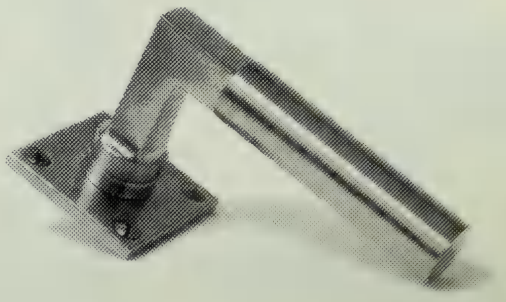
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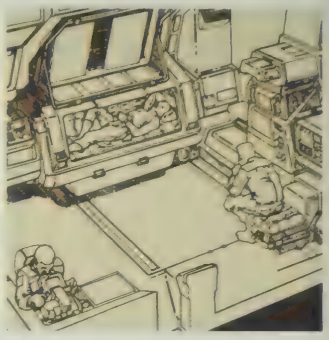
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THE FUTURE In 1999, we won't be living on the moon. But that hasn't stopped some architects from trying.

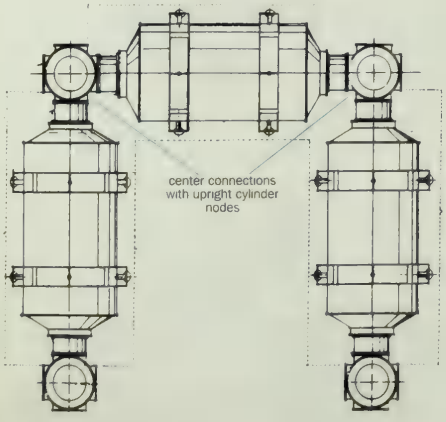
BY TED KATAUSKAS

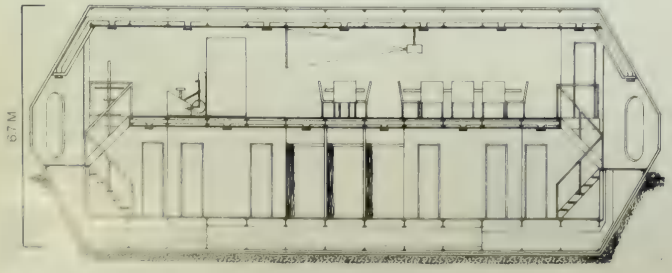


Remembering *Space: 1999*, the sci-fi series from my youth, which supposed that by next year, people would be watching soufflés rise in lunar gravity, I recently telephoned Wendell Mendell. I wanted to ask the unofficial "Father of Lunar-based Concepts" at the Johnson Space Center in Houston where things stood, design-wise, with NASA's version of Moonbase Alpha.

"I could run around my office and find some lunar base designs," said Mendell, who, despite lacking a mandate or much funding from Congress or NASA, has been doggedly husbanding the design of a manned lunar outpost for the past 16 years. "But these were all done by university architecture students who needed a project to work on." As long as NASA's resources are tied up in the design of the International Space Station and the space shuttle operations, it appears that Mendell's moonbase will remain an academic project.

Two weeks later, I received a bulging manila envelope. Inside were nearly 200 pages of schematics, drawings, and text relating to a moonbase project called Genesis (see drawings). Included in the package was everything from stress equations for spheres, toruses, cylinders, and cones to sketches of low-gravity furniture and a laundry room, along with plans for a kitchen equipped with a range and convection oven (perfect for soufflés). There was even a colorful treatise on lunar hygiene, which noted that in an enclosed environment "objectionable body odors can quickly build without adequate personal hygiene facilities" and that "good grooming can enhance self-image, improve morale, and increase productivity."





Genesis was designed by 20 undergraduate and graduate students at the Center for Architecture and Planning Research at the University of Wisconsin, Milwaukee, one of four architecture schools that participated in the NASA-funded Advanced Design Program in Space Architecture from 1989 to 1995.

One of the students was Janis Huebner-Moths, whose father had designed rocket equipment for NASA in the Mercury days and instilled in his daughter a love for all things space-related. When she heard that architecture students at the University of Wisconsin were designing a moonbase for NASA, she filled out an application.

John Connolly, one of Mendell's supporters at the Johnson Space Center's Exploration Programs Office, the agency's long-range-planning operation, was the NASA official flown out from Houston to critique Genesis. "Architects were the first to breach NASA's engineering barrier," Connolly says. "When we look beyond Earth's orbit and start talking about space stations and moonbases, we're talking about something entirely out of the engineering ballpark and more into the experience-base of architects. Ten years ago, architects at NASA were a curiosity; now we don't think there's anything odd about them."

After graduation, Huebner-Moths moved to Houston and worked as a space architect at Johnson while she completed her master's thesis on space habitation and privacy. Now Janis Connolly, she is applying her Genesis experience to the design of a self-contained, long-duration test facility that will be used to try out lighting concepts, interior color schemes, crew-habitat configurations, and a bioregenerative life-support system envisioned, Connolly says, for "surface habitats for partial gravity application." In other words, a moonbase.

"Some architects are skeptical about what I do and say it isn't really architecture," Connolly says. "But they don't really understand the many parallels." For example, Connolly compares the design of a building in a seismic environment like San Francisco to special building considerations on the moon. "As the lunar night becomes day, temperatures will rise 100 degrees an hour," Connolly says. "So you have to select materials that will withstand that."

Even though Moonbase Alpha hasn't been built, the push to colonize the moon has had at least one effect: it has sparked a quiet revolution within the ranks of NASA, in which the prominence of rocket scientists is being challenged by the emergence of space architects. "The world of space might be difficult for my peers to comprehend," says Connolly, "but it certainly does stretch architecture to its limits." ■

Ted Katauskas is a freelance writer in Portland, Oregon.

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